Vol. 1023 Number 4

OFFICIAL GAZETTE

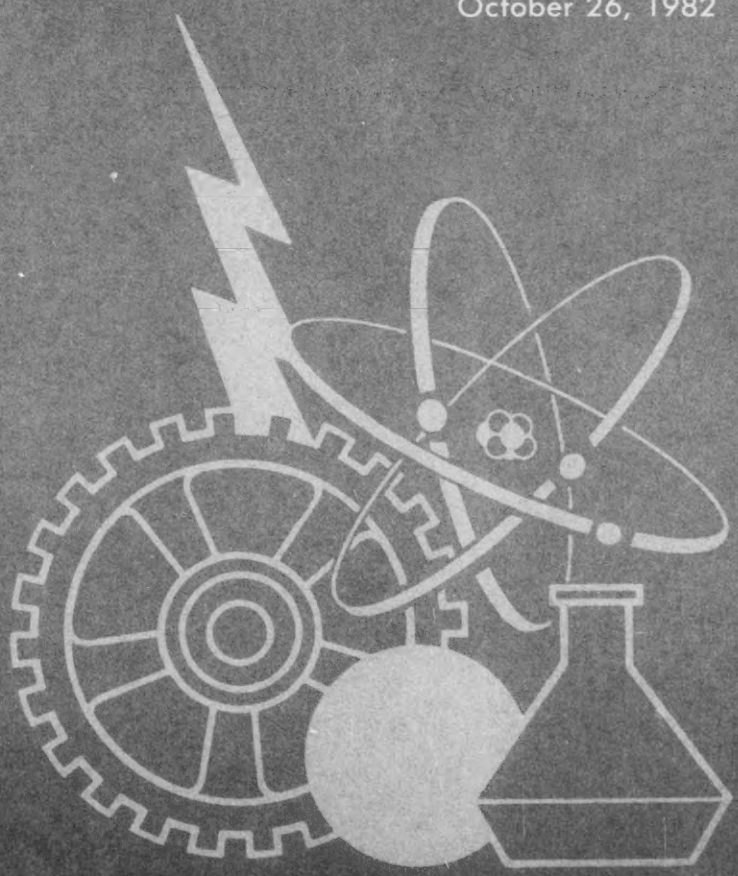
of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

October 26, 1982



U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

October 26, 1982 Volume 1023 Number 4

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries and the most recent PCT rule changes, see the notices appearing in the Official Gazette at 1001 O.G. 14 on Dec. 9, 1980 and at 1012 O.G. 20 on Nov. 17, 1981. For use of the European Patent Office as a searching authority for PCT applications filed in the United States, see the notice in the Official Gazette of Sept. 28, 1982 at 1022 O.G. 52.

Note that the international fees have been increased as of Jan. 1, 1982 and that the domestic PCT fees have been increased as of Oct. 1, 1982. Domestic PCT fees were increased by a rule change which was published at 1021 O.G. 11 on Aug. 10, 1982. The current schedule of fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	710.00
International Fees	
Basic Fees (first 30 pages)	270.00
Basic Supplemental Fee (for each sheet over 30)	6.00
Designation fee (for each national or regional office)	65.00

DONALD J. QUIGG,
Sept. 10, 1982. *Deputy Commissioner of Patents & Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

D. 262,279, Re. S.N. 405,581, Filed Aug. 5, 1982, Cl. 34/34, MOBILE SELF-POWERED HYDRAULIC LIFT, Rallie P. Rallis, et al., Owner of Record: *Mark Industries, Carson, Calif.,* Attorney or Agent: Robert R. Thornton, Ex. Gp.: 290

4,113,544, Re. S.N. 400,160, Filed July 20, 1982, Cl. 156/384, PORTABLE LABEL PRINTING AND APPLYING MACHINE, Yo Sato, Tokyo, Japan, Owner of Record: *Kabushiki Kaisha Sato Kenkyusho, Tokyo, Japan,* Attorney or Agent: Sidney G. Faber, et al., Ex. Gp.: 161

4,215,351, Re. S.N. 400,546, Filed July 21, 1982, Cl. 346/136, CHART RECORDS, David John Lowe, Owner of Record: *National Research Development Corp., London, England,* Attorney or Agent: L. Martin Flynn, Ex. Gp.: 211

4,256,104, Re. S.N. 397,792, Filed July 16, 1982, Cl. 128/214G, EQUIPMENT SETS AND SYSTEM FOR THE SEQUENTIAL ADMINISTRATION OF MEDICAL LIQUIDS AT DUAL FLOW RATES, Andrew J. Muetterties, et al., Owner of Record: *Inventor,* Attorney or Agent: Robert L. Niblack, Ex. Gp.: 335

4,300,388, Re. S.N. 405,492, Filed Aug. 5, 1982, Cl. 73/49.2, METHOD FOR LEAKAGE MEASUREMENT, William B. Hansel, et al., Owner of Record: *Sun Oil Co., Philadelphia, Pa.,* Attorney or Agent: J. Edward Hess, et al., Ex. Gp.: 244

4,308,956, Re. S.N. 400,865, Filed July 22, 1982, Cl. 206/611, RESEALABLE CONTAINER, John J. Steinke, et al., Owner of Record: *Church & Dwight Co., Inc., Piscataway, N.J.,* Attorney or Agent: Nelson Littell, Jr., et al., Ex. Gp.: 241

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

3,551,076, Reexam. No. 90/000,255, Requested: Sept. 9, 1982, Cl. 417/385, TUBULAR DIAPHRAGM PUMP, Lawrence F. Wilson, Owner of Record: *Lapp Insulator Co., Inc., Leroy, N.Y.,* Attorney or Agent: Hart, Baxley, etc., Ex. Gp.: 343, Requester: Harold C. Wegner, Washington, D.C.

4,152,167, Reexam. No. 90/000,261, Requested: Sept. 24, 1982, Cl. 251/28, MATRIX FORMING COMPOSITION, Howard J. Horvitz, et al., Owner of Record: *Set Products, Inc., Macedonia, Ohio,* Attorney or Agent: Fay & Sharpe, Ex. Gp.: 341, Requester: J. Suzanne Siebert Of Majestic, Gallagher, Parsons & Siebert, San Francisco, Calif.

4,161,436, Reexam. No. 90/000,263, Requested: Sept. 29, 1982, Cl. 204/157.1R, METHOD OF ENERGIZING A MATERIAL, Gordon Gould, Owner of Record: *Panelrama Corp., Ardmore, Pa.,* Attorney or Agent: Lerner, David, et al., Ex. Gp.: 112 Requester: Lumonics, Inc., c/o Robert W. Duckworth, Orlando, Fla.

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents and Trademarks on or before Nov. 15, 1982.

DONALD J. QUIGG,
Sept. 29, 1982. *Chairman, Committee on Enrollment.*

Dubno, Herbert, 5938 Liebig Ave., Riverdale, N.Y. 10471

Frazier, Roy D., 14109 Bauer Dr., Rockville, Md. 20853

Moy, Robert C., 1600 S. Eads St., Apt. 1027N, Arlington, Va. 22202

Sabet, Sohrab, 943 Weston, Ottawa, Ont., Canada K1G 1X1

Removal From Register

The following list contains the names of persons to whom a letter was directed to the last post office address furnished to the Committee on Enrollment. No reply was received within the period of ten (10) days therein set.

Accordingly, the names of the following persons have been removed from the Register of Patent Attorneys and Patent Agents.

DONALD J. QUIGG,
Sept. 29, 1982. *Chairman, Committee on Enrollment.*

Harper, Horace S., Samuels, Clark, Everett & Harper, 707 Keyser Bldg., Calvert & Redwood Sts., Baltimore, Md. 21202

Kreider, M. David, 2512 Crest Ave., Cheverly, Md. 20785

Strader, Frederick M., 8825 Cold Spring Rd., Potomac, Md. 20854

Tushin, Aaron A., 1300 Highfield Dr., Clearwater, Fla. 33516

Status of PTO Services

The following is an update of the status of PTO services as of Sept. 30, 1982:

Service Item	FY 1982 Performance Goal (Calendar Days)	Actual	Comment
Internal Mail Processing & Delivery	4	3	
Filing Receipts:			
Patents	22	46	Reduction from 100 days in February.
Trademarks	30	40	
Patent Copies:			
Window Coupons	5	90% within 5 days 98% within 10 days	
Mail Coupons*	29	99% within 29 days	
Letter Orders*	34	99% within 34 days	
Certified Copies:			
Trademark Regs.	30	17	
Applications-As-Filed	20	95% within 15 days	
File-Wrapper/Contents	N/A	80% within 15 days 98% within 30 days	
Walk-up Certification	1	99% within 1 day	Service now includes applications-as-filed.
Trademark Search Room:			
Filing Drawings	21	30	
Filing Reg. Certificates	3	5	
Patent Assignments	15	76	Expect reduction in FY 1983.
Trademark Assignments	21	77	Expect reduction in FY 1983.
Patent Official Gazette	Issue Date	On Schedule	
Patent Grants	Issue Date	On Schedule	
Trademark Official Gazette	Issue Date	1 day late	
Trademark Registrations	Issue Date	9 days late	

*Goal now includes mail processing and delivery time. A recent survey of mail delivery time for these services yielded the fact that the *average* amount of time required for one-way delivery is seven calendar days. Therefore the prior goal was increased by 14 days to reflect average time from mailing by requestors to receipt of copies.

User Survey

The report of the User Survey conductd early this year has been completed. This survey was conducted to gather data on the public perception of the adequacy of services provided by the PTO and identify principal areas of concerns. There were 325 respondents, 89 of which are local Bar Association members, 88 out-of-town Patent Law Association members (Cleveland and Los Angeles), and 148 Patent Public Search Room users.

Most respondents rated as good or excellent the quality of drawing corrections, certified copy services, and identification of serial numbers stamped on the applicants' self-addressed post cards; the accuracy of all services; the value of computerized search mechanisms in the Patent Search and Assignment Search Rooms; the helpfulness of the draftsmen, patent search advisors, employees in the Office of the Director of Patent and Trademark Services, and the Scientific Library staff; and the file integrity of trademark registrations and the microfilm collections for patent and trademark assignments and for patents (Scientific Library). On the other hand, most respondents rated as poor or fair all items relating to the timeliness of services, integrity of files (except for the microfilm collections and trademark registrations), search room working conditions, and quality of photocopy/microfilm reader-printer services. These items have suffered over the past several years due primarily to resource shortages.

The report contains specific data for each service area, as well as an action plan for all items for which there was predominantly a negative perception. Although only 3 out of 48 items were considered as poor by the majority of respondents, the 24 rated fair are also specifically addressed in the action plan. Progress on the action plan will be reported in this monthly newsletter.

To obtain a copy of the full report, contact:

Assistant Commissioner for Administration
U.S. Patent and Trademark Office
CP 3-11C34
Washington, D.C. 20231
(703) 557-2290

Improvements to Services

- *Official Search Services* —Substantial progress was made in efforts to improve the official search services.

  An internal "special" search service was initiated in hopes of reducing the number of incoming officials search requests. This procedure calls for PTO organizations to initiate their own internal search to locate requested files if the file is identified by the Patent Application Locator and Monitoring System (PALM) to be in their organization.

  The PALM System is now being used to expedite official searches for lost files. The serial or patent number of the missing file is entered into a "Lost Case File" in the PALM System. Upon any subsequent transaction for that file, a message will be instantly flashed to the person entering the data. The message will indicate that this file had been lost and should be sent immediately to the Official Search Unit. Use of this automated search tool should eliminate repetitive searches for files and result in more files being found.

  To enable searchers to locate lost files more quickly, a series of specially designed training sessions have been and will continue to be given to official search personnel to ensure better understanding of the patent and trademark process workflow as it relates to abandoned and registered files.

  Official search procedures are currently being revised in an attempt to decrease official search workload and eliminate wasted efforts on the part of official searchers. This new procedure involves the issuance of acknowledgements, indicating to the requester the estimated closing date of the search; the termination of requests after 60 days; and the encouragement to request reconstruction of the file, if it is critically needed. Individuals requesting official searches are being encouraged to submit prompt and non-repetitive requests for official searches, and to cancel searches if the file is located by the requester after the official search has been requested.

- *Timeliness in Providing Patented and Trademark Files* —A special service is now available to out-of-town requesters who wish to inspect patented files or abandoned or registered trademark files upon arrival in the area. Those who have to travel a considerable distance to inspect files may place their requests by telephone (703) 557-3560, to Mr. Luther Campbell, five days in advance of their arrival. Normally, a 24 hour notice is sufficient to fill an order. A five day notice should be allowed in the event that the file is located in the Federal Records Center in Suitland, Md., rather than in the PTO file Repository in Crystal City. The patented files requested will be reserved in the Record Room in the Patent Search Room area. Trademark files will be held in the Trademark Search Library. Requesters will be called to confirm that the file is available. To maintain maximum file availability, telephone requests will not be accepted more than five days prior to the expected pick-up date, and files will not be reserved after close of business on the stated arrival date.

  Requests for files are now being time-stamped upon receipt and delivery, so that sample surveys can be taken monthly to determine if the processing goal of 8 work hours is being met. Data compiled during the month of August indicated that approximately 84% of all requests were processed in eight hours or less. A large portion of the requests still outstanding after eight hours involved files which had to be ordered from the Federal Records Center in Suitland, Md., or which required a bar code label to be made and placed on the file prior to forwarding to the requester.

- *Timeliness in Providing Certified Copies* —The local certification service in the Patent Public Search Room is now offered for pending and abandoned patent applications, as well as patented files. This service is normally provided within one day. Users of this service must leave document copies together with the original document or file at the certification desk in the Patent Public Search Room. A page-by-page comparison of the copy will be made with the original and, if the copies are proper, complete and in order, a certificate will be affixed. The current charge for this service is $2.00 per certificate. Beginning October 1, 1982, the charge will be $0.10 per page compared, plus $3.50 per certificate.

  Those who must have certified copies by a specific date, but do not find it convenient to use the local certification service, should indicate the due date clearly on their order form. Every reasonable effort will be made to ensure that such orders are processed in a timely fashion.

- *Patent Search Room Working Conditions* —All air registers were repaired and over 400 lights were replaced by our lessor, Charles E. Smith Cos. For the first time in a decade, all 2,700 lights were operable at the same time.

  A routine maintenance program has been instituted to ensure that adequate lighting continues.

  Maps have been placed in the lobbies of Crystal Plaza buildings 2, 3, and 4, beneath the posted directories. These should make it easier to find the Patent Public Search Room, Trademark Search Library, and all other PTO organizations spread throughout several buildings in Crystal City.

- *Quality of Photocopy/Microfilm Reader-Printer Services* —Higher magnification lenses have been installed in all microfilm reader-printers. The new lenses will provide larger, more readable images, and should eliminate any image quality deterioration that had resulted from discoloration of the old lenses.

In Oct., expanded photocopy services will be offered to users of the Public Search Room. Patent files can be deposited at the photocopy sales window for reproduction, and requested copies will generally be returned within eight working hours. There will be a fee of $0.20 per copy for this service.

Trademark Application Inspection —Members of the public report that it is now easier to locate and inspect files of pending trademark applications. Since the beginning of the year most pending applications have been stored in the examining divisions ("law offices") where they are being examined. See Official Gazette Jan. 5, 1982, 1014 TMOG 190.

Sept. 30, 1982.

THERESA A. BRELSFORD,
Acting Assistant Commissioner for Administration.

Public Law 97-247
97th Congress

An Act

To authorize appropriations to the Patent and Trademark Office in the Department of Commerce, and for other purposes.

Aug. 27, 1982
[H.R. 6260]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That there is authorized to be appropriated for the payment of salaries and necessary expenses of the Patent and Trademark Office to become available for fiscal year 1983, $76,000,000, and in fiscal years 1984 and 1985 such sums as may be necessary as well as such additional or supplemental amounts as may be necessary, for increases in salary, pay, retirement, or other employee benefits authorized by law. Funds available under this section shall be used to reduce by 50 per centum the payment of fees under section 41 (a) and (b) of title 35, United States Code, by independent inventors and nonprofit organizations as defined in regulations established by the Commissioner of Patents and Trademarks, and by small business concerns as defined in section 3 of the Small Business Act and by regulations established by the Small Business Administration. When so specified and to the extent provided in an appropriation Act, any amount appropriated pursuant to this section and, in addition, such fees as shall be collected pursuant to title 35, United States Code, and the Trademark Act of 1946, as amended (15 U.S.C. 1051 et seq.), may remain available without fiscal year limitation.

Patent and Trademark Office. Appropriation authorization.

15 USC 632.

SEC. 2. Notwithstanding any other provision of law, there is authorized to be appropriated for the payment of salaries and expenses of the Patent and Trademark Office, $121,461,000 for the fiscal year ending September 30, 1982, and such additional or supplemental amounts as may be necessary for increases in salary, pay, retirement, or other employee benefits authorized by law.

SEC. 3. (a) Section 41(a) of title 35, United States Code, is amended to read as follows:

"(a) The Commissioner shall charge the following fees:

Fees.

"1. On filing each application for an original patent, except in design or plant cases, $300; in addition, on filing or on presentation at any other time, $30 for each claim in independent form which is in excess of three, $10 for each claim (whether independent or dependent) which is in excess of twenty, and $100 for each application containing a multiple dependent claim. For the purpose of computing fees, a multiple dependent claim as referred to in section 112 of this title or any claim depending therefrom shall be considered as separate dependent claims in accordance with the number of claims to which reference is made. Errors in payment of the additional fees may be rectified in accordance with regulations of the Commissioner.

35 USC 112.

"2. For issuing each original or reissue patent, except in design or plant cases, $500.

"3. In design and plant cases:

"a. On filing each design application, $125.

"b. On filing each plant application, $200.

"c. On issuing each design patent, $175.

"d. On issuing each plant patent, $250.

"4. On filing each application for the reissue of a patent, $300; in addition, on filing or on presentation at any other time, $30 for each claim in independent form which is in excess of the number of independent claims of the original patent, and $10 for each claim (whether independent or dependent) which is in excess of twenty and also in excess of the number of claims of the original patent. Errors in payment of the additional fees may be rectified in accordance with regulations of the Commissioner.

"5. On filing each disclaimer, $50.

"6. On filing an appeal from the examiner to the Board of Appeals, $115; in addition, on filing a brief in support of the appeal, $115, and on requesting an oral hearing before the Board of Appeals, $100.

"7. On filing each petition for the revival of an unintentionally abandoned application for a patent or for the unintentionally delayed payment of the fee for issuing each patent, $500, unless the petition is filed under sections 133 or 151 of this title, in which case the fee shall be $50.

35 USC 133, 151.

"8. For petitions for one-month extensions of time to take actions required by the Commissioner in an application:

"a. On filing a first petition, $50.

"b. On filing a second petition, $100.

"c. On filing a third or subsequent petition, $200.".

(b) Section 41(b) of title 35, United States Code, is amended to read as follows:

Maintenance fees.

"(b) The Commissioner shall charge the following fees for maintaining a patent in force:

"1. Three years and six months after grant, $400.

"2. Seven years and six months after grant, $800.

"3. Eleven years and six months after grant, $1,200.

Expiration.

Unless payment of the applicable maintenance fee is received in the Patent and Trademark Office on or before the date the fee is due or within a grace period of six months thereafter, the patent will expire as of the end of such grace period. The Commissioner may require the payment of a surcharge as a condition of accepting within such six-month grace period the late payment of an applicable maintenance fee. No fee will be established for maintaining a design or plant patent in force.".

Surcharge.

(c) Section 41(c) of title 35, United States Code, is amended to read as follows:

Maintenance fee, delayed payment.

"(c)(1) The Commissioner may accept the payment of any maintenance fee required by subsection (b) of this section after the six-month grace period if the delay is shown to the satisfaction of the Commissioner to have been unavoidable. The Commissioner may require the payment of a surcharge as a condition of accepting payment of any maintenance fee after the six-month grace period. If the Commissioner accepts payment of a maintenance fee after the six-month grace period, the patent shall be considered as not having expired at the end of the grace period.

Surcharge.

"(2) No patent, the term of which has been maintained as a result of the acceptance of a payment of a maintenance fee under this subsection, shall abridge or affect the right of any person or his successors in business who made, purchased or used after the six-month grace period but prior to the acceptance of a maintenance fee

under this subsection anything protected by the patent, to continue the use of, or to sell to others to be used or sold, the specific thing so made, purchased, or used. The court before which such matter is in question may provide for the continued manufacture, use or sale of the thing made, purchased, or used as specified, or for the manufacture, use or sale of which substantial preparation was made after the six-month grace period but before the acceptance of a maintenance fee under this subsection, and it may also provide for the continued practice of any process, practiced, or for the practice of which substantial preparation was made, after the six-month grace period but prior to the acceptance of a maintenance fee under this subsection, to the extent and under such terms as the court deems equitable for the protection of investments made or business commenced after the six-month grace period but before the acceptance of a maintenance fee under the subsection.".

(d) Section 41(d) of title 35, United States Code, is amended to read as follows:

Fees.

"(d) The Commissioner will establish fees for all other processing, services, or materials related to patents not specified above to recover the estimated average cost to the Office of such processing, services, or materials. The yearly fee for providing a library specified in section 13 of this title with uncertified printed copies of the specifications and drawings for all patents issued in that year will be $50.".

35 USC 13.

(e) Section 41(f) of title 35, United States Code, is amended to read as follows:

Adjusted fees.

"(f) The fees established in subsections (a) and (b) of this section may be adjusted by the Commissioner on October 1, 1985, and every third year thereafter, to reflect any fluctuations occurring during the previous three years in the Consumer Price Index, as determined by the Secretary of Labor. Changes of less than 1 per centum may be ignored,".

(f) Subsection (a) of section 31 of the Trademark Act of 1946, as amended (15 U.S.C. 1113), is amended by deleting "Fees will be set and adjusted by the Commissioner to recover in aggregate 50 per centum of the estimated average cost to the Office of such processing. Fees for all other services or materials related to trademarks and other marks will recover the estimated average cost to the Office of performing the service or furnishing the material.".

(g) Section 42(c) of title 35, United States Code, is amended by adding the following sentence at the end thereof: "Fees available to the Commissioner under section 31 of the Trademark Act of 1946, as amended (15 U.S.C. 1113), shall be used exclusively for the processing of trademark registrations and for other services and materials related to trademarks.".

SEC. 4. Section 3(a) of title 35, United States Code is amended (1) by deleting the phrase "not more than fifteen"; and (2) by inserting the phrase "appointed under section 7 of this title" immediately after the phrase "examiners-in-chief".

SEC. 5. Section 111 of title 35, United States Code, is amended to read as follows:

Applications.

"SEC. 111. Application for patent shall be made, or authorized to be made, by the inventor, except as otherwise provided in this title, in writing to the Commissioner. Such application shall include (1) a specification as prescribed by section 112 of this title; (2) a drawing as prescribed by section 113 of this title; and (3) an oath by the applicant as prescribed by section 115 of this title. The application

35 USC 112.
35 USC 113.
35 USC 115.

must be accompanied by the fee required by law. The fee and oath may be submitted after the specification and any required drawing are submitted, within such period and under such conditions, including the payment of a surcharge, as may be prescribed by the Commissioner. Upon failure to submit the fee and oath within such prescribed period, the application shall be regarded as abandoned, unless it is shown to the satisfaction of the Commissioner that the delay in submitting the fee and oath was unavoidable. The filing date of an application shall be the date on which the specification and any required drawing are received in the Patent and Trademark Office.".

Filing date.

SEC. 6. (a) Section 116 of title 35, United States Code, is amended (1) by deleting the phrase "Joint inventors" from the title and inserting in its place "Inventors"; and (2) in the third paragraph, by deleting the phrase "a person is joined in an application for patent as joint inventor through error, or a joint inventor is not included in an application through error" and inserting in its place the phrase "through error a person is named in an application for patent as the inventor, or through error an inventor is not named in an application".

(b) Section 256 of title 35, United States Code, is amended to read as follows:

"§ 256. Correction of named inventor

"Whenever through error a person is named in an issued patent as the inventor, or through error an inventor is not named in an issued patent and such error arose without any deceptive intention on his part, the Commissioner may, on application of all the parties and assignees, with proof of the facts and such other requirements as may be imposed, issue a certificate correcting such error.

"The error of omitting inventors or naming persons who are not inventors shall not invalidate the patent in which such error occurred if it can be corrected as provided in this section. The court before which such matter is called in question may order correction of the patent on notice and hearing of all parties concerned and the Commissioner shall issue a certificate accordingly.".

SEC. 7. Section 6 of title 35, United States Code, is amended by deleting paragraph (d) thereof.

SEC. 8. (a) Section 8(a) of the Trademark Act of 1946, as amended (15 U.S.C. 1058(a)), is amended (1) by deleting the word "still"; and (2) by inserting the phrase "in commerce" immediately after the word "use".

(b) Section 8(b) of the Trademark Act of 1946, as amended (15 U.S.C. 1058(b)), is amended (1) by deleting the word "still"; and (2) by inserting the phrase "in commerce" immediately after the word "use".

SEC. 9. (a) Section 13 of the Trademark Act of 1946, as amended (15 U.S.C. 1063), is amended (1) by deleting the phrase "a verified" and inserting in its place the word "an"; (2) by adding the phrase "when requested prior to the expiration of an extension" immediately after the word "cause"; and (3) by deleting the fourth sentence.

(b) Section 14 of the Trademark Act of 1946, as amended (15 U.S.C. 1064), is amended by deleting the word "verified".

SEC. 10. Section 15 of the Trademark Act of 1946, as amended (15 U.S.C. 1065), is amended by deleting the phrase "the publication" and inserting in its place the word "registration".

SEC. 11. The first sentence of section 16 of the Trademark Act of 1946, as amended (15 U.S.C. 1066), is amended to read as follows: "Upon petition showing extraordinary circumstances, the Commissioner may declare that an interference exists when application is made for the registration of a mark which so resembles a mark previously registered by another, or for the registration of which another has previously made application, as to be likely when applied to the goods or when used in connection with the services of the applicant to cause confusion or mistake or to deceive.".

SEC. 12. Section 21 of title 35, United States Code, is amended—

(1) by deleting the phrase "Day for taking action falling on Saturday, Sunday, or holiday" from the title and inserting in its place the phrase "Filing date and day for taking action";

(2) by inserting the following as subsection (a):

"(a) The Commissioner may by rule prescribe that any paper or fee required to be filed in the Patent and Trademark Office will be considered filed in the Office on the date on which it was deposited with the United States Postal Service or would have been deposited with the United States Postal Service but for postal service interruptions or emergencies designated by the Commissioner.";

Filing date.

(3) by designating the existing paragraph as subsection (b); and

(4) by inserting the word "federal" in subsection (b), as designated above, immediately after the word "a".

SEC. 13. Section 6(a) of title 35, United States Code, is amended (1) by deleting the word "and", third occurrence, and inserting in its place a comma; (2) by inserting the phrase ", or exchanges of items or services" immediately after the word "programs"; and (3) by inserting the phrase "or the administration of the Patent and Trademark Office" immediately after the word "law", second occurrence.

SEC. 14. (a) Section 115 of title 35, United States Code, is amended by (1) deleting the phrase "shall be" and inserting in its place the word "is"; and (2) inserting the following immediately after the phrase "United States", third occurrence: ", or apostille of an official designated by a foreign country which, by treaty or convention, accords like effect to apostilles of designated officials in the United States".

(b) Section 261 of title 35, United States Code, is amended, in the third paragraph, by inserting the following immediately after the phrase "United States", third occurrence: ", or apostille of an official designated by a foreign country which, by treaty or convention, accords like effect to apostilles of designated officials in the United States".

(c) Section 11 of the Trademark Act of 1946, as amended (15 U.S.C. 1061), is amended by (1) deleting the phrase "shall be", first occurrence, and inserting in its place the word "is"; and (2) inserting the following immediately after the phrase "United States", third occurrence: ", or apostille of an official designated by a foreign country which, by treaty or convention, accords like effect to apostilles of designated officials in the United States".

SEC. 15. Section 13 of title 35, United States Code, is amended by deleting "(a) 9" and inserting in its place "(d)".

SEC. 16. Section 173 of title 35, United States Code, is amended to read as follows: "Patents for designs shall be granted for the term of fourteen years."

Effective dates.
35 USC 41 note.

SEC. 17. (a) Sections 1, 2, 4, 7, and 13 through 15 of this Act shall take effect on the date of enactment of this Act. Sections 3 and 16 of this Act shall take effect on October 1, 1982. The maintenance fees provided for in section 3(b) of this Act shall not apply to patents applied for prior to the date of enactment of this Act. Each patent applied for on or after the date of enactment of this Act shall be subject to the maintenance fees established pursuant to section 3(b) of this Act or to maintenance fees hereafter established by law, as to the amounts paid and the number and timing of the payments.

(b)(1) Title 35, United States Code, is amended by inserting after section 293 the following new section of chapter 29:

35 USC 294.

"§ 294. Voluntary arbitration

"(a) A contract involving a patent or any right under a patent may contain a provision requiring arbitration of any dispute relating to patent validity or infringement arising under the contract. In the absence of such a provision, the parties to an existing patent validity or infringement dispute may agree in writing to settle such dispute by arbitration. Any such provision or agreement shall be valid, irrevocable, and enforceable, except for any grounds that exist at law or in equity for revocation of a contract.

Awards.
9 USC 1 *et seq.*

"(b) Arbitration of such disputes, awards by arbitrators and confirmation of awards shall be governed by title 9, United States Code, to the extent such title is not inconsistent with this section. In any such arbitration proceeding, the defenses provided for under section 35 USC 282. 282 of this title shall be considered by the arbitrator if raised by any party to the proceeding.

"(c) An award by an arbitrator shall be final and binding between the parties to the arbitration but shall have no force or effect on any Modification. other person. The parties to an arbitration may agree that in the event a patent which is the subject matter of an award is subsequently determined to be invalid or unenforceable in a judgment rendered by a court to competent jurisdiction from which no appeal can or has been taken, such award may be modified by any court of competent jurisdiction upon application by any party to the arbitration. Any such modification shall govern the rights and obligations between such parties from the date of such modification.

Notices.

"(d) When an award is made by an arbitrator, the patentee, his assignee or licensee shall give notice thereof in writing to the Commissioner. There shall be a separate notice prepared for each patent involved in such proceeding. Such notice shall set forth the names and addresses of the parties, the name of the inventor, and the name of the patent owner, shall designate the number of the Modification. patent, and shall contain a copy of the award. If an award is modified by a court, the party requesting such modification shall give notice of such modification to the Commissioner. The Commissioner shall, upon receipt of either notice, enter the same in the record of the prosecution of such patent. If the required notice is not filed with the Commissioner, any party to the proceeding may provide such notice to the Commissioner.

"(e) The award shall be unenforceable until the notice required by subsection (d) is received by the Commissioner.".

(2) The analysis for chapter 29 of title 35 of the United States Code is amended by adding at the end the following:

"294. Voluntary arbitration.".

(c) Sections 5, 6, 8 through 12, and 17(b) of this Act shall take effect six months after enactment. 35 USC 294 note.

Approved August 27, 1982.

LEGISLATIVE HISTORY—H.R. 6260:

HOUSE REPORT No. 97–542 (Comm. on the Judiciary).
CONGRESSIONAL RECORD, Vol. 128 (1982):
June 8, considered and passed House.
Aug. 12, considered and passed Senate.
WEEKLY COMPILATION OF PRESIDENTIAL DOCUMENTS, Vol. 18, No. 36 (1982):
Aug. 28, Presidential statement.

97TH CONGRESS, 2d Session | HOUSE OF REPRESENTATIVES | REPORT No. 97-542

PATENT AND TRADEMARK OFFICE AUTHORIZATION

MAY 17, 1982.—Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

Mr. KASTENMEIER, from the Committee on the Judiciary, submitted the following

REPORT

[To accompany H.R. 6260]

[Including cost estimate of the Congressional Budget Office]

The Committee on the Judiciary, to whom was referred the bill (H.R. 6260) to authorize appropriations to the Patent and Trademark Office in the Department of Commerce, and for other purposes, having considered the same, report favorably thereon with an amendment and recommend that the bill as amended do pass.

The amendment strikes out all after the enacting clause of the bill and inserts a new text which appears in italic type in the reported bill.

PURPOSE OF THE BILL

The purpose of H.R. 6260 is to authorize appropriations for the Patent and Trademark Office for fiscal years 1983 through 1985.

STATEMENT

The Subcommittee on Courts, Civil Liberties and the Administration of Justice previously held two days of hearings on the legislation, receiving testimony from a representative group of witnesses including the Commissioner of Patents and Trademarks, the American Bar Association Section of Patent, Trademark and Copyright Law, the American Patent Law Association, the Patent, Trademark and Copyright Section of the State Bar of Virginia, the United States Trademark Association and the General Patent Counsel of the General Electric Corporation.

H.R. 6260 reflects the recommendation of the Administration with three modifications as follows. First, the Administration pro-

posal authorized the Commissioner of Patents and Trademarks to establish fees administratively. The subcommittee approved an amendment to set forth specific fees in the statute and limited the Commissioner's authority to raise fees. Second, the Administration recommended that user fees recover 100% of the costs of actual processing of patents and trademarks. The subcommittee amended the bill to reduce by 50% patent filing and maintenance fees for individual inventors, small businesses and not for profit institutions. The effect of the amendment is to increase by $8 million the authorized appropriation which would have been provided under the original Administration request. Third, the subcommittee adopted a recommendation of the Commissioner of Patents and Trademarks, the American Bar Association and a coalition of corporate patent counsel permitting arbitration of patent disputes.

H.R. 6260 was considered by the Full Committee on the Judiciary on May 11, 1982 and was approved as reported by the subcommittee with an amendment offered by Mr. Frank described below.

SYNOPSIS OF H.R. 6260

SECTIONS 1-3

Authorizes the Patent and Trademark Office for fiscal year 1983 at an appropriations level of $76,000,000 and for fiscal years 1984 and 1985 such sums as may be necessary. This would be augmented by additional fee income under the bill of approximately $79 million for a total budget of $155 million. In fiscal year 1982 the Patent and Trademark Office was authorized at a level of $118,961,000 of which $29,600,000 was provided through fee income. Fiscal year 1983 will be the first year in which fee income under P.L. 96-517 will be credited to the Patent and Trademark Office without being counted as part of its authorized appropriation. Had this new accounting procedure been applied to fiscal year 1982 the authorization and appropriation for the Patent and Trademark Office would have been $89 million. This constitutes the actual level of taxpayer support of the Office. Thus, H.R. 6260 authorizes the expenditure of tax revenue in fiscal 1983 to support the Patent and Trademark Office at a level $21 million lower than for fiscal 1982. H.R. 6260 proposes to double current fees as the means of making up for the difference between a lower level of taxpayer support and an increased total budget. Further, maintenance fees which were first authorized in P.L. 96-517 and which will not begin to be collected until fiscal year 1986 (October 1, 1985) will also be doubled over the amounts provided for under P.L. 96-517.

The overall objective of H.R. 6260 is to provide for increased user support for the Patent and Trademark Office costs associated with the actual processing of patent applications by fiscal year 1996. The fee schedule is designed to return to the government 100% of actual costs. However, an amendment to the original Administration proposal adopted by the subcommittee would reduce by half the fees for individuals, small businesses and nonprofit inventors. At the present time less than 25% of the actual costs of processing patent applications are supported by fee revenue and under P.L. 96-517, which becomes effective on October 1, 1982, this amount

will gradually begin to rise but will only reach 50% of actual costs in 1996.

The amendment offered by Mr. Frank and approved by the Committee modifies that portion of Section 3 of H.R. 6260 dealing with Trademark fees. Public Law 96–517 (35 United States Code, section 31(a)) provides, "Fees will be set and adjusted by the Commissioner to recover in aggregate 50 per centum of the estimated average cost to the Office of such processing. Fees for all other services or materials related to trademarks and other marks will recover the estimated average cost . . . of performing the service or furnishing the material."

The Administration requested that the figure, "50 per centum", be changed to "100 per centum", thus mandating full recovery to the Treasury of all costs associated with processing trademarks. An amendment offered during subcommittee consideration of the legislation proposed to reduce fee generated revenue supporting processing of trademarks to less than the 100 per centum recovery level. The amendment was not agreed to. The author of the amendment, Mr. Frank, then proposed to amend the law to provide a statutory fee schedule which would return revenue to the Patent and Trademark Office at a level designed to recover 100 per centum of costs. However, following consultations with interested parties, Mr. Frank modified his amendment simply to repeal those portions of P.L. 96–517 which mandate a specified level of cost recovery for the processing of trademark registrations. Thus, the level of cost recovery for processing of trademark registrations will be within the discretion of the Commissioner. The Committee is aware of the concerns of users of the Trademark registration system, however, and intends to exercise vigorous oversight with respect to the Commissioner to ensure that fees remain at a reasonable level and that trademark registrations are processed in an efficient and cost effective manner. As part of this oversight, the Committee recommends the following fee structure to the Commissioner for Fiscal Year 1983.

Type of fee:	*Proposed fee*
Application filing fee per class	$175
Renewal fee	300
Late renewal	100
Section 12(c) claim	100
New certificate	100
Certificate of correction	100
Disclaimer to registration	100
Amendment to registration	100
Per class combines section 8 and 15 affidavit	200
Per class section 8 affidavit alone	100
Per class section 15 affidavit alone	100
All petitions to Commissioner	100
Cancellation opposition per class	200
TTAB appeal	100
Certified copies	10
Copies of trademarks	1
Assignments	(1)

[1] 100 plus for each mark in addition to 1.

Section 3(d) also permits the Commissioner of Patents to accept late payment of maintenance fees where it is established that the delay in payment was unavoidable.

Section 4 permits the Commissioner of Patents and Trademarks to appoint temporary examiners in chief for the Board of Patent Appeals to deal more flexibly with workload.

Section 5 permits late filing of the oath and fee accompanying submission of specifications and drawings which accompany patent claims.

Section 6 permits greater flexibility in correcting mistakes in the naming of inventors on a patent application.

Section 7 allocates funds from the Patent and Trademark Office to the Department of State to pay the financial obligations of administering the Patent Cooperation Treaty.

Section 8 clarifies the Trademark law with respect to what constitutes use of a mark "in commerce".

Section 9 deletes the burdensome technical requirement that trademark oppositions be verified.

Section 10 makes the date of registration rather than the date of publication the crucial date for purposes of establishing the incontestability of a trademark. This eliminates an ambiguity in the present law.

Section 11 limits the declaration of interferences under the trademark law to situations where extraordinary circumstances exist.

Section 12 authorizes the Commissioner of the Patent and Trademark Office the flexibility to deal with problems of delay in filing due to postal service breakdowns.

Section 13 permits the Commissioner of Patents to enter into cooperative studies, programs, exchanges and similar ventures associated with the administration of the Patent Office.

Section 14 conforms U.S. Patent and Trademark Law to a recent international treaty governing diplomatic or consular legalization of documents.

Section 15 corrects a mistaken citation in P.L. 96-517.

Section 16 creates a uniform term for design patents.

Section 17 establishes the effective dates for provisions of the Act. Increased filing fees would apply to all applications made on or after the date of enactment of H.R. 6260.

Section 18 permits voluntary arbitration of patent disputes.

SECTION-BY-SECTION ANALYSIS

SECTION 1

This section authorizes appropriations for the Patent and Trademark Office for the payment of salaries and necessary expenses of the Office. For Fiscal Year 1983, this section authorizes appropriations of $76,000,000, and in fiscal years 1984 and 1985 such sums as may be necessary, as well as such additional and supplemental amounts as may be necessary to cover any increases in salary, pay, retirement, or employee benefits which may be authorized by law. Funds made available by these appropriations are to be used to reduce by 50 per centum the amount of the fees to be paid under title 35, United States Code, section 41(a) and (b) by independent inventors and nonprofit organizations as defined in regulations established by the Commissioner of Patents and Trademarks, and by

small business concerns as defined in section 3 of the Small Business Act and by regulations established by the Small Business Administration.

In addition, fees collected pursuant to title 35, United States Code, and the Trademark Act of 1946, as amended (15 U.S.C. 1051 et seq.), will augment the authorized appropriation to provide the resources needed to conduct the operations of the Office for fiscal year 1983. The total resources for the Office in fiscal year 1983, that is, the amount appropriated pursuant to this section plus fees collected pursuant to the patent and trademark laws, which will be available to the Office, are estimated to be $154,934,000. The corresponding levels for fiscal year 1984 and fiscal year 1985 are estimated in the President's Budget to be $167 million and $176 million, respectively. Any additional amounts to cover increases in salary, pay, retirement, or other employee benefits which may be authorized by law will be in addition to, and will therefore increase, those program levels. Finally, any funds appropriated pursuant to this section and all fees collected, when specified in an appropriation act, will remain available without any fiscal year limitation.

SECTION 2

This section provides that, notwithstanding any other provision of law, there is authorized to be appropriated to the Patent and Trademark Office for fiscal year 1982, $121,461,000 and such additional or supplemental amounts as may be necessary for increases in salary, pay, retirement, or other employee benefits authorized by law. This section increases the amount authorized for the Patent and Trademark Office by $2.5 million over that authorized in Public Law 97-35. The President is recommending a supplemental appropriation of $2,500,000 for the Patent and Trademark Office for fiscal year 1982 in order to carry out the program recommendations included in his fiscal year 1983 Budget.

SECTION 3

This section establishes certain statutory fees which are to be charged by the Commissioner and authorizes the Commissioner to establish other fees whose amounts are not specifically set. Thus, the major routine fees which are applicable to patents and patent application processing are established (e.g., filing, issuance, and maintenance fees). The Commissioner is authorized to establish fees for all other processing, services, or materials related to patents which are not specifically established by statute. The processing and service fees, which would include such items as fees for filing various petitions to the Commissioner relating to the processing of patent applications, would be established at a level to recover the estimated average costs to the Office. A more specific discussion of the various provisions of this section is set forth below.

Section 3(a) amends section 41(a) of title 35 to provide the amounts of the fees for filing and issuance of patent applications. In addition, the section includes provisions for increasing the filing fees due to increased complexities presented by certain applications, e.g., applications containing more than a specified number of

claims and any application containing a multiple dependent claim. The section also provides that fees will be charged when the number of claims is increased above the specified number or when a multiple dependent claim is first presented, whether on filing or at a later point in processing.

Under section 41(a)1, the filing fee for an original patent, except in design or plant cases, is $300. In addition, on filing or on presentation at any other time, $30 is due for each claim in independent form which is in excess of three, $10 is due for each claim (whether independent or dependent) which is in excess of twenty, and $100 is due for each application containing a multiple dependent claim. The latter fee is a one-time charge per application due the first time a multiple dependent claim is presented for examination. For the purpose of computing fees, a multiple dependent claim as referred to in section 112 of title 35, United States Code, or any claim depending therefrom, will be considered as separate dependent claims in accordance with the number of claims to which reference is made. Under the section, errors in payment of the additional fees may be rectified in accordance with regulations of the Commissioner. This will enable the Commissioner to establish regulations whereby patent applicants may correct, without prejudice, errors in payment of the additional fees, i.e., those in addition to the basic fees established.

Under section 41(a)2, the fee for issuing all original and reissue patents, except in design or plant cases, would be a uniform amount of $500. No supplemental issue fees are required.

Section 41(a)3 establishes fixed fees for filing applications for, and issuance of design and plant patents. For design patent cases, the filing fee would be $125 and the issue fee $175. For plant patent cases, the filing fee would be $200 and the issue fee $250.

Section 41(a)4 relates to fees in reissue cases and establishes a fee of $300 for filing each application for the reissue of a patent. In addition, on filing or on presentation at any other time, $30 is due for each claim in independent form which is in excess of the number of independent claims of the original patent, and $10 is due for each claim (whether independent or dependent) which is in excess of twenty and also in excess of the number of claims of the original patent. Errors in payment of the additional fees may be rectified in accordance with regulations of the Commissioner.

Under section 41(a)5, a fee of $50 would be established for filing each disclaimer in a patent or patent application.

Section 41(a)6 establishes a fee due on filing an appeal from the examiner to the Board of Appeals of $115. In addition, a fee of $115 is due on filing a brief in support of the appeal, and a fee of $100 is due for requesting an oral hearing before the Board of Appeals.

Section 41(a)7 establishes two different fees for filing petitions with different standards to revive abandoned patent applications. The same two fees are applicable to petitions to accept the delayed payment of the fee for issuing a patent. The fees set forth in this section are due on filing the petition. Since the section provides for two alternative fees with different standards, the section would permit the applicant seeking revival or acceptance of a delayed payment of the fee for issuing a patent to choose one or the other of the fees and standards under such regulations as the Commis-

sioner may establish. Under the section the Commissioner could establish time limits within which petitions under each of the different fees and standards can be filed. The section establishes a fee of $500 for filing each petition for revival or for acceptance of the delayed payment of an issue fee where the abandonment or the failure to pay the issue fee is unintentional. In order to prevent abuse and injury to the public the Commissioner could require a terminal disclaimer equivalent to the period of abandonment and could require applicants to act promptly after becoming aware of the abandonment. The section establishes a fee of $50 for filing a petition under sections 133 or 151 of title 35 in accordance with standards presently in effect requiring that the delay resulting in the abandonment, or the delay in payment of the issue fee, be unavoidable. Under this section a petition accompanied by either a fee of $500 or a fee of $50 would not be granted where the abandonment or the failure to pay the fee for issuing the patent was intentional as opposed to being unintentional or unavoidable. This section would permit the Commissioner to have more discretion than present law to revive abandoned applications and accept late payment of the fee for issuing a patent in appropriate circumstances.

Section 41(a)8 establishes fees for the filing of petitions for extensions of time. Various time periods are set by the Office for taking actions on matters relating to patent applications. These time periods are set pursuant to statute or by regulations established by the Commissioner under the authority granted to the Commissioner by statute. This section would provide for fees for filing petitions to extend the time periods set pursuant to statute or by regulations for taking action within any limitations set by statute.

A fee of $50 is established for filing a request for a first one month extension of time, an additional fee of $100 for filing a request for a second one month extension of time which would expire two months after the end of the time period set for taking action, and an additional fee of $200 for filing a request for a third one month extension of time which would expire three months after the end of the time period set for taking action. A subsequent or fourth extension could be requested if additional time was available under the statute. In no case could a period be extended beyond the maximum time set by statute.

The Commissioner may issue regulations providing when, within any maximum period permitted by statute, petitions for extensions of time, and the required fee therefor, may be filed. This section does preclude the Commissioner from waiving the fee for filing a petition for an extension of time where the Office extends the period due to equity considerations or sufficient cause.

Section 41(b) provides that the Commissioner charge the following fees for maintaining a patent other than a design or plant patent, in force: at three years and six months after grant, $400; at seven years and six months after grant, $800; and at eleven years and six months after grant, $1,200. Unless payment of the applicable maintenance fee is received in the Patent and Trademark Office on or before the date the fee is due or within a grace period of six months thereafter, the patent will expire as of the end of such grace period. The Commissioner may require the payment of

a surcharge as a condition of accepting within such six-month grace period the late payment of a maintenance fee.

In order to avoid an inequitable loss of patent rights, the Commissioner is given the authority to accept payment of any maintenance fee after the six-month grace period if it is established that the delay in payment was unavoidable. It is intended that the Commissioner will issue regulations establishing guidelines for acceptance of late payment. After the expiration of a reasonable period of time, the patentee would bear a heavy burden of proof that the delay was unavoidable. A surcharge may be imposed by the Commissioner as a precondition to acceptance of a late fee. This surcharge may be in addition to any surcharge imposed for payment during the grace period.

A provision is included to protect the rights of one who began using or who took steps to begin use of a patent which expired for failure to pay a maintenance fee and which was subsequently reestablished by acceptance of the late payment. The intervening rights provision in section 41(c)(2) is similar to the intervening rights provision in 35 U.S.C. 252 concerning reissued patents.

Section 41(d) provides that the Commissioner establish fees for all other processing services, or materials related to patents not specified in section 41 at an amount calculated to recover the estimated average cost to the Office of such processing, services, or materials. Such processing and other services includes, but is not limited to, the processing of various petitions desiring certain actions to be taken regarding patent applications, recording of assignments, reexamination of patents and the processing of international applications. Fees for materials include the price of patent copies, certifications and other copying services. The yearly fee for providing a library specified in section 13 of title 35 with uncertified copies of the specifications and drawings for all patents issued in that year is set at $50.

Section 41(f) provides that the fees established in subsections (a) and (b) of section 41 may be adjusted by the Commissioner on October 1, 1985, and every third year thereafter, to reflect any fluctuations occurring during the previous three years in the Consumer Price Index, as determined by the Secretary of Labor. Changes of less than one per centum may be ignored by the Commissioner in making such adjustments.

Subsection (a) of section 31 of the Trademark Act of 1946, as amended (15 U.S.C. 1113), is being changed to grant the Commissioner discretion to establish the level of recovery of office costs related to trademarks. It is expected that the Commissioner will set the fees in a way that the filing fee will be kept as low as possible to foster use of the Federal registration system. This may require that other fees for services or materials related to trademarks recover more than their actual estimated cost in order that the Commissioner achieve in the aggregate adequate cost recovery for the entire trademark operation.

A provision is inserted in section 42(c) of title 35 in order to ensure that the trademark fees collected are used to fund trademark operations only and not the processing of patent applications.

SECTION 4

Section 3 of title 35 is amended by deleting specific reference to the number of examiners-in-chief in the first sentence. Elimination of the upper limit on the number of permanent members of the Board of Appeals would provide greater flexibility in filling most of its personnel needs, thereby avoiding an excess of examiner details. The authority to appoint acting examiners-in-chief, however, is maintained in order that temporary fluctuations in the workload of the Board may be accommodated.

SECTION 5

Under revised section 111 of title 35, the filing date of an application would be that on which the specification and any required drawings are received by the Patent and Trademark Office. The oath or declaration and filing fee could be submitted at such later time as established by the Commissioner, without any loss of the original filing date. Under the amendment, an applicant could either file the oath or declaration (including the applicant's signature) and fee together with an application or submit them at a later time as determined by the Commissioner.

The section would also authorize the imposition of a surcharge as a condition for accepting filing of the oath of payment of the filing fee after the filing date of the application. Since an application filed without the oath or declaration would not be signed or "made" by the applicant, the amendment permits a patent attorney or agent, authorized by the applicant, to submit the specification and drawings for the purpose of obtaining a filing date. Should the applicant, however, fail to file the oath or declaration, or pay the filing fee within the time limits set by the Commissioner, the application would be regarded as having been abandoned.

SECTION 6

The third paragraph of section 116 of title 35 is amended to enlarge the possibilities for correcting misnamed inventive entities. As a consequence, correction would be permitted also in cases where the person originally named as inventor was in fact not the inventor of the subject matter contained in the application. If such error occurred without any deceptive intention on the part of the true inventor, the Commissioner would have the authority to substitute the true inventor for the erroneously named person. Although probably rarer, instances such as changes from a mistakenly identified sole inventor to a different, but actual, joint inventors, conversions from erroneously identified joint inventors to different but actual, joint inventors, and conversions from erroneously identified joint inventors to a different, but actual, sole inventor would also be permitted. In each instance, however, the Commissioner must be assured of the presence of innocent error, without deceptive intention on the part of the true inventor or inventors, before permitting a substitution of a true inventor's name.

The ability to receive a filing date based on a specification and drawings without signature as set forth in revised section 111 of title 35, and to file the oath or declaration and pay the filing fee

within such period as determined by the Commissioner is also available to joint inventors.

Section 256 of title 35, which is a companion to section 116, would be amended to similarly enlarge the possibilities for correction of misnamed inventors in issued patents.

SECTION 7

Section 6(d) of title 35, which provides for the allocation of appropriated Patent and Trademark Office funds to the Department of State for payment of United States financial obligations under the Patent Cooperation Treaty, is deleted. The Department of State has traditionally assumed responsibility for financial obligations for international agreements to which the United States adheres.

SECTION 8

Section 8(a) of the Trademark Act is amended to clarify that the continued use required to be shown in the sixth year be use "in commerce". Although it is believed by some that omission of the words "in commerce" may have been inadvertent in the 1946 Act, this section has been interpreted so that use in a foreign country, or use in intrastate commerce, is sufficient. Such interpretation is fundamentally in conflict with other requirements of the Act.

Section 8(b) of the Act is also amended to clarify that the continued use required to be shown in the sixth year be use "in commerce". Although it is believed by some that omission of the words "in commerce" may have been inadvertent in the 1946 Act, this section has interpreted so that use in a foreign country, or use in intrastate commerce, is sufficient. Such interpretation is fundamentally in conflict with other requirements of the Act.

Section 8(b) of the Act is also amended to clarify that the continued use required to be shown in the sixth year be use "in commerce" for registrations published under section 12(c) of the Act. (This pertains to registrations issued under the Act of March 3, 1881 and the Act of February 20, 1905).

The word "still" has been deleted from section 8(a) and 8(b). Thus, the owner of a registration issued on the basis of a foreign registration under the provisions of section 44(e) of the Act will have to submit an affidavit to the effect that the mark is in use in commerce. Since the mark need not be used in commerce when it is registered, the requirement cannot be required to state that it is "still" in such use.

SECTION 9

Section 13 of the Trademark Act is amended to delete the requirement that an opposition be verified. The sentence which allowed an unverified application to be verified at a later date has been deleted. In addition, a phrase has been added to make it clear that any subsequent extension of time to file an opposition, beyond the first extension, must be requested before the end of the preceding extension.

Section 14 of the Trademark Act would also be amended to delete the requirement that a petition to cancel a registration be verified.

SECTION 10

Section 15 of the Trademark Act is amended to change the term "the publication" to "registration" in the first sentence. This change makes the date of registration rather than the date of publication the crucial date for purposes of incontestability. It will also make section 15 consistent with sections 22 and 33 of the Act.

SECTION 11

Section 16 of the Trademark Act is amended to limit the declaration of interferences to those situations where a petition to the Commissioner shows that extraordinary circumstances exist. Unless extraordinary circumstances exist, the rights of the parties can be determined adequately by the existing opposition and cancellation procedures. Additionally, if an interference is declared between an application and a registration and the applicant wins, a cancellation must still be initiated against the registration.

SECTION 12

A new subsection (a) has been added to section 21 of title 35 to authorize, but not to require, the Commissioner of Patents and Trademarks to give as the filing date of any paper or fee which is required to be filed in the Patent and Trademark Office the date on which the paper or fee was deposited with the United States Postal Service. The Commissioner may also give as the filing date of any paper or fee which was required to be filed in the Patent and Trademark Office the date it would have been deposited with the United States Postal Service but for postal service interruptions or emergencies which the Commissioner designates. The requirements governing whether any given paper or fee may be given the filing date of the day on which it was, or would have been, deposited with the United States Postal Service will be set forth in regulations established by the Commissioner.

Section 21(b) of title 35 is identical to existing section 21 with two minor amendments. The word "federal" has been inserted before the phrase "holiday within the District of Columbia" to clarify the nature of the holiday.

SECTION 13

This section clarifies the authority of the Commissioner in section 6(a) of title 35 to enter into a wide range of cooperative agreements concerning the patent and trademark laws or the administration of the Patent and Trademark Office. These agreements are in addition to the exchange of publications authorized in 35 U.S.C. 11(b) and 12. These cooperative agreements may take the form of studies, programs, exchanges, and other similar ventures. Thus, the Patent and Trademark Office could, for example, exchange patent copies, non-patent literature, tapes, or services in return for goods or services of value to the Patent and Trademark Office.

SECTION 14

The amendments of 35 U.S.C. 115 and Section 11 of the Trademark Act of 1946 recognize the Hague "Convention Abolishing the Requirement of Legalization for Foreign Public Documents" which entered into force in the United States on October 15, 1981. The Convention abolishes the requirement of diplomatic or consular legalization for foreign public documents which are sworn to or acknowledged by a notary public in any of the countries adhering to the Convention. For documents executed by a notary public of all other foreign countries, diplomatic or consular legalization will still be required.

The amendment of 35 U.S.C. 261 is intended to give affirmative effect to acknowledgments executed pursuant to the Hague Convention.

SECTION 15

This section corrects an incorrect citation. Public Law 96-517 amended section 41 of title 35, United States Code, in a way which eliminated 35 U.S.C. § 41(a)(9). Unfortunately, section 13 of title 35, United States Code, was not amended accordingly by Public Law 96-517. This section corrects that oversight.

SECTION 16

This section sets a uniform term of fourteen years for all design patents.

SECTION 17

Sections 17(a) and (c) specify the effective dates of the Act. Section 17(a) also specifies that the maintenance fees provided for in section 3(b) of this Act will only apply to patents in which the application was filed on and after the date of enactment or to maintenance fees later established by law.

Section 17(b) adds a section 294 to title 35 providing for the voluntary arbitration of patent disputes by the parties to the dispute. The section requires that the Commissioner be notified in writing of an award made by an arbitrator or modified by a court. Such notification will be entered in the record of the prosecution of the patent.

At present, agreements to arbitrate some aspects of disputes arising under patent licenses are enforceable by the courts; however, there have been court decisions that have disapproved arbitration of disputes concerning patent validity or infringement. In this regard, see, for example, *Zip Mfg. Co.* v. *Pep Mfg. Co.*, 44 F.2d 184, 7 U.S.P.Q. 62 (D. Del. 1930) and *Beckman Instruments, Inc.* v. *Technical Developments Corp.*, 433 F.2d 55, 167 U.S.P.Q. 10 (7th Cir. 1965).

Partly as a reaction to those decisions, during the 93rd Congress both the Department of Commerce and the Department of Justice endorsed a provision specifically authorizing arbitration of validity and infringement disputes. This provision, included in an omnibus patent law revision bill, S. 2504, was never enacted due to the many controversial aspects of that legislation.

In the view of the Committee, a statutory authorization of voluntary agreements to arbitrate validity and infringement disputes would benefit both the parties to these disputes and the public.

Statutory endorsement of arbitration agreements would assure the parties that they could avail themselves of the numerous advantages of arbitration without the possibility of having to reargue the dispute in court. The advantages of arbitration are many: it is usually cheaper and faster than litigation; it can have simpler procedural and evidentiary rules; it normally minimizes hostility and is less disruptive of ongoing and future business dealings among the parties; it is often more flexible in regard to scheduling of times and places of hearings and discovery devices; and, arbitrators are frequently better versed than judges and juries in the area of trade customs and the technologies involved in these disputes.

The enforcement of voluntary arbitration provisions would serve the public in two ways. First, the availability of arbitration with its numerous advantages will enhance the patent system and thus will encourage innovation. This view is supported by the Committee for Economic Development in their January 1980 statement entitled "Stimulating Technological Progress." Secondly, arbitration could relieve some of the burdens on the overworked Federal courts. Chief Justice Burger in his speech to the American Bar Association on January 24, 1982, generally endorsed the use of arbitration to reduce the judicial backlog. Also, I think it is important to note that the American Bar Association's Section on Patent, Trademark and Copyright Law has endorsed court enforcement of arbitration agreements calling for arbitration of validity and infringement.

The recommendations of the Secretary of Commerce to increase substantially patent and trademark user fees were made on the promise that such increases "will lay the groundwork for revitalizing the patent and trademark systems." The Secretary committed to three major goals: (1) to reach an average patent application pendency time of 18 months by FY 1987, (2) to issue an examiner's first action on trademark registrability in three months and disposal of an application within 13 months, and (3) to move realistically toward a fully automated Office by the 1990's. In accepting the Administration's recommendations on user fees, the Committee fully expects the Administration to live up to its end of the bargain to bring about a first-class Patent and Trademark Office. To provide an opportunity for timely and effective Committee oversight of progress toward improving the Patent and Trademark Office, the Committee directs that the Secretary of Commerce report annually to the Committee on progress toward achieving the three major goals of the Patent and Trademark Office, as outlined above, and, in addition, promptly inform the Committee at any time it appears that any of the goals, for any reason, is viewed as not attainable.

OVERSIGHT STATEMENT

The Committee on the Judiciary has oversight responsibility over the Patent and Trademark Office in the Department of Commerce. In addition to its ongoing oversight, the Committee's Subcommittee on Courts, Civil Liberties and the Administration of Justice held an oversight hearing with respect to the Patent and Trademark Office

on March 4, 1981, published as Oversight Hearings Before the Subcommittee on Courts, Civil Liberties and the Administration of Justice of the Committee on the Judiciary, House of Representatives, Ninety-Seventh Congress, First Session on the Copyright Office, The U.S. Patent and Trademark Office, and the Copyright Royalty Tribunal. Serial No. 17.

The Committee expects to continue its oversight activities in this area.

STATEMENT OF THE BUDGET COMMITTEE

No statement has been received on H.R. 6260 from the House Committee on the Budget.

STATEMENT OF THE CONGRESSIONAL BUDGET OFFICE

Pursuant to clause 7, rule XIII of the Rules of the House of Representatives and section 403 of the Congressional Budget Act of 1974, the following is the cost estimate of H.R. 6260, as amended, prepared by the Congressional Budget Office.

U.S. CONGRESS,
CONGRESSIONAL BUDGET OFFICE,
Washington, D.C., May 13, 1982.

Hon. PETER W. RODINO, Jr.,
Chairman, Committee on the Judiciary, House of Representatives, Washington, D.C.

DEAR MR. CHAIRMAN: Pursuant to Section 403 of the Congressional Budget Act of 1974, the Congressional Budget Office has prepared the attached cost estimate for H.R. 6260, a bill to authorize appropriations to the Patent and Trademark Office in the Department of Commerce, and for other purposes.

Should the Committee so desire, we would be pleased to provide further details on this estimate.

Sincerely,

ALICE M. RIVLIN, *Director.*

CONGRESSIONAL BUDGET OFFICE, COST ESTIMATE

1. Bill number: H.R. 6260.

2. Bill title: A bill to authorize appropriations to the Patent and Trademark Office in the Department of Commerce, and for other purposes.

3. Bill status: As ordered reported by the House Committee on the Judiciary, May 11, 1982.

Bill purpose: H.R. 6260 would authorize 1982 appropriations at a level $2.5 million above the amount already appropriated, and would provide a $76 million authorization level in 1983 to carry out the activities of the Patent and Trademark Office (PTO). In addition, such sums as may be necessary are authorized for fiscal years 1984 and 1985, plus such additional or supplemental amounts as may be necessary for increases in salary, pay, retirement, or other benefits authorized by law for each fiscal year 1983 through 1985. PTO would also have available for obligation offsetting fee collections as provided for in Public Law 96-517, plus the additional fees as specified in H.R. 6260.

Assuming enactment of H.R. 6260, total PTO collections over time would result in recovery of approximately 100 percent of patent and trademark processing costs. Individuals, small businesses, and non-profit institutions would be exempt from the proposed additional fees, however, but would continue to follow the fee schedule outlined in P.L. 96-517, which assumes the ultimate recovery of approximately 50 percent of all processing costs.

The Presidnent's 1982 budget includes a request for a $2.5 million supplemental for the PTO. The Administration has recommended increasing user fees to ultimately recover 100 percent of processing costs beginning in 1983, but does not provide for any exemptions to the proposed fee increases relative to current law. The effect of exemptions is to increase by approximately $8 million the authorized level of appropriations relative to the Administration's request.

In addition, the bill would make a number of other changes that are not expected to have a cost impact.

5. Cost estimate:

[By fiscal years, in millions of dollars]

	1982	1983	1984	1985	1986
Authorization level:					
Specified	2.5	76.0			
Estimated		6.8	86.4	86.8	
Subtotal	2.5	82.8	86.4	86.8	
Total estimated outlays	2.4	61.8	82.4	82.8	5.5

Including outlays from appropriations to date for PTO, total 1982 outlays are estimated to be $121.5 million, and total 1983 outlays are estimated to be $79.8.

The costs of this bill fall within budget subfunction 376.

6. Basis of estimate: The authorization levels for PTO for 1982 and 1983 are those specified in the bill. The estimate authorization levels for 1984 and 1985 assume a level of funding sufficient to maintain a program level of $167 million and $176 million, respectively, including offsetting collections. In addition, authorization for increases in pay and other benefits of approximately $6.8 million, $7.4 million, and $7.8 million for fiscal years 1983 through 1985, respectively, were estimated based on CBO's current inflators. Outlays are based on historical spending patterns.

The estimated collections to PTO as a result of fees charged to cover the costs of processing trademarks and patents were provided by the agency, and assume the fee structure outlined in the bill. The estimated collections, under current law and under H.R. 6260, are shown in the table below.

[By fiscal years, in millions of dollars]

	1982	1983	1984	1985	1986
Estimated offsetting collections:					
Current law		47.8	52.7	57.7	
Added by H.R. 6260		31.2	35.3	39.3	
Total—H.R. 6260		79.0	88.0	97.0	

7. Estimate comparison: None.
8. Previous CBO estimate: None.
9. Estimate prepared by: Mary B. Maginniss.
10. Estimate approved by: C. G. Nuckols (James L. Blum, Assistant Director for Budget Analysis).

COMMITTEE VOTE

The Committee on the Judiciary ordered H.R. 6260 as amended reported by a voice vote, without objection being heard, with a quorum of Members being present.

CHANGES IN EXISTING LAW MADE BY THE BILL, AS REPORTED

In compliance with clause 3 of Rule XIII of the Rules of the House of Representatives, changes in existing law made by the bill, as reported, are shown as follows (existing law proposed to be omitted is enclosed in black brackets, new matter is printed in italics, existing law in which no change is proposed is shown in roman):

TITLE 35, UNITED STATES CODE

PART I—PATENT AND TRADEMARK OFFICE

* * * * * * *

CHAPTER 1—ESTABLISHMENT, OFFICERS, FUNCTIONS

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§ 3. Officers and employees

(a) There shall be in the Patent and Trademark Office a Commissioner of Patents and Trademarks, a Deputy Commissioner, two Assistant Commissioners, and [not more than fifteen] examiners-in-chief *appointed under section 7 of this title.* The Deputy Commissioner, or, in the event of a vacancy in that office, the Assistant Commissioner senior in date of appointment shall fill the office of Commissioner during a vacancy in that office until the Commissioner is appointed and takes office. The Commissioner of Patents and Trademarks, the Deputy Commissioner, and the Assistant Commissioners shall be appointed by the President, by and with the advice and consent of the Senate. The Secretary of Commerce, upon the nomination of the Commissioner, in accordance with law shall appoint all other officers and employees.

* * * * * * *

§ 6. Duties of Commissioner

(a) The Commissioner, under the direction of the Secretary of Commerce, shall superintend or perform all duties required by law

respecting the granting and issuing of patents and the registration of trademarks; shall have the authority to carry on studies [and], programs, *or exchanges of items or services* regarding domestic and international patent and trademark law *or the administration of the Patent and Trademark Office;* and shall have charge of property belonging to the Patent and Trademark Office. He may, subject to the approval of the Secretary of Commerce, establish regulations, not inconsistent with law, for the conduct of proceedings in the Patent and Trademark Office.

(b) The Commissioner, under the direction of the Secretary of Commerce, may, in coordination with the Department of State, carry on programs and studies cooperatively with foreign patent offices and international intergovernmental organizations, or may authorize such programs and studies to be carried on, in connection with the performance of duties stated in subsection (a) of this section.

(c) The Commissioner, under the direction of the Secretary of Commerce, may, with the concurrence of the Secretary of State, transfer funds appropriated to the Patent and Trademark Office, not to exceed $100,000 in any year, to the Department of State for the purpose of making special payments to international intergovernmental organizations for studies and programs for advancing international cooperation concerning patents, trademarks, and related matters. These special payments may be in addition to any other payments or contributions to the international organization and shall not be subject to any limitations imposed by law on the amounts of such other payments or contributions by the Government of the United States.

[(d) The Commissioner, under the direction of the Secretary of Commerce, may, with the concurrence of the Secretary of State, allocate funds appropriated to the Patent Office, to the Department of State for the purpose of payment of the share on the part of the United States to the working capital fund established under the Patent Cooperation Treaty. Contributions to cover the share on the part of the United States of any operating deficits of the International Bureau under the Patent Cooperation Treaty shall be included in the annual budget of the Patent Office and may be transferred by the Commissioner, under the direction of the Secretary of Commerce, to the Department of State for the purpose of making payments thereof to the International Bureau.]

* * * * * * *

§ 13. Copies of patents for public libraries

The Commissioner may supply printed copies of specifications and drawings of patents to public libraries in the United States which shall maintain such copies for the use of the public, at the rate for each year's issue established for this purpose in section 41[(a)9] *(d)* of this title.

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CHAPTER 2—PROCEEDINGS IN THE PATENT AND TRADEMARK OFFICE

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§ 21. [Day for taking action falling on Saturday, Sunday, or holiday] *Filing date and day for taking action.*

(a) The Commissioner may by rule prescribe that any paper or fee required to be filed in the Patent and Trademark Office will be considered filed in the Office on the date on which it was deposited with the United States Postal Service or would have been deposited with the United States Postal Service but for postal service interruptions or emergencies designated by the Commissioner.

(b) When the day, or the last day, for taking any action or paying any fee in the United States Patent and Trademark Office falls on Saturday, Sunday, or a *Federal* holiday within the District of Columbia, the action may be taken, or the fee paid, on the next succeeding secular or business day.

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CHAPTER 4—PATENT FEES

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§ 41. Patent fees

[(a) The Commissioner of Patents will establish fees for the processing of an application for a patent, from filing through disposition by issuance or abandonment, for maintaining a patent in force, and for providing all other services and materials related to patents. No fee will be established for maintaining a design patent in force.

[(b) By the first day of the first fiscal year beginning on or after one calendar year after enactment of this Act, fees for the actual processing of an application for a patent, other than for a design patent, from filing through disposition by issuance or abandonment, will recover in aggregate 25 per centum of the estimated average cost to the Office of such processing. By the first day of the first fiscal year beginning on or after one calendar year after enactment, fees for the processing of an application for a design patent, from filing through disposition by issuance or abandonment, will recover in aggregate 50 per centum of the estimated average cost to the Office of such processing.

[(c) By the fifteenth fiscal year following the date of enactment of this Act, fees for maintaining patents in force will recover 25 per centum of the estimated cost to the Office, for the year in which such maintenance fees are received, of the actual processing all applications for patents, other than for design patents, from filing through disposition by issuance or abandonment. Fees for maintaining a patent in force will be due three years and six months, seven years and six months, and eleven years and six months after the grant of the patent. Unless payment of the applicable maintenance fee is received in the Patent and Trademark Office on or before the date the fee is due or within a grace period of six months thereafter, the patent will expire as of the end of such

grace period. The Commissioner may require the payment of a surcharge as a condition of accepting within such six-month grace period the late payment of an applicable maintenance fee.

[(d) By the first day of the first fiscal year beginning on or after one calendar year after enactment, fees for all other services or materials related to patents will recover the estimated average cost to the Office of performing the service or furnishing the material. The yearly fee for providing a library specified in section 13 of this title with uncertified printed copies of the specifications and drawings for all patents issued in that year will be $50.]

(a) The Commissioner shall charge the following fees:

1. On filing each application for an original patent, except in design or plant cases, $300; in addition, on filing or on presentation at any other time, $30 for each claim in independent form which is in excess of three, $10 for each claim (whether independent or dependent) which is in excess of twenty, and $100 for each application containing a multiple dependent claim. For the purpose of computing fees, a multiple dependent claim as referred to in section 112 of this title or any claim depending therefrom shall be considered as separate dependent claims in accordance with the number of claims to which reference is made. Errors in payment of the additional fees may be rectified in accordance with regulations of the Commissioner.

2. For issuing each original or reissue patent, except in design or plant cases, $500.

3. In design and plant cases:

a. On filing each design application, $125.

b. On filing each plant application, $200.

c. On issuing each design patent, $175.

d. On issuing each plant patent, $250.

4. On filing each application for the reissue of a patent, $300; in addition, on filing or on presentation at any other time, $30 for each claim in independent form which is in excess of the number of independent claims of the original patent, and $10 for each claim (whether independent or dependent) which is in excess of twenty and also in excess of the number of claims of the original patent. Errors in payment of the additional fees may be rectified in accordance with regulations of the Commissioner.

5. On filing each disclaimer, $50.

6. On filing an appeal from the examiner to the Board of Appeals, $115; in addition, on filing a brief in support of the appeal, $115, and on requesting an oral hearing before the Board of Appeals, $100.

7. On filing each petition for the revival of an unintentionally abandoned application for a patent or for the unintentionally delayed payment of the fee for issuing each patent, $500, unless the petition is filed under sections 133 or 151 of this title, in which case the fee shall be $50.

8. For petitions for one-month extensions of time to take actions required by the Commissioner in an application:

a. On filing a first petition, $50.

b. On filing a second petition, $100.

c. On filing a third or subsequent petition, $200.

(b) The Commissioner shall charge the following fees for maintaining a patent in force:

1. Three years and six months after grant, $400.

2. Seven years and six months after grant, $800.

3. Eleven years and six months after grant, $1,200.

Unless payment of the applicable maintenance fee is received in the Patent and Trademark Office on or before the date the fee is due or within a grace period of six months thereafter, the patent will expire as of the end of such grace period. The Commissioner may require the payment of a surcharge as a condition of accepting within such six-month grace period the late payment of an applicable maintenance fee. No fee will be established for maintaining a design or plant patent in force.

(c)(1) The Commissioner may accept the payment of any maintenance fee required by subsection (b) of this section after the six-month grace period if the delay is shown to the satisfaction of the Commissioner to have been unavoidable. The Commissioner may require the payment of a surcharge as a condition of accepting payment of any maintenance fee after the six-month grace period. If the Commissioner accepts payment of a maintenance fee after the six-month grace period, the patent shall be considered as not having expired at the end of the grace period.

(2) No patent, the term of which has been maintained as a result of the acceptance of a payment of a maintenance fee under this subsection, shall abridge or affect the right of any person or his successors in business who made, purchased or used after the six-month grace period but prior to the acceptance of a maintenance fee under this subsection anything protected by the patent, to continue the use of, or to sell to others to be used or sold, the specific thing so made, purchased, or used. The court before which such matter is in question may provide for the continued manufacture, use or sale of the thing made, purchased, or used as specified, or for the manufacture, use or sale of which substantial preparation was made after the six-month grace period but before the acceptance of a maintenance fee under this subsection, and it may also provide for the continued practice of any process, practiced, or for the practice of which substantial preparation was made, after the six-month grace period but prior to the acceptance of a maintenance fee under this subsection, to the extent and under such terms as the court deems equitable for the protection of investments made or business commenced after the six-month grace period but before the acceptance of a maintenance fee under the subsection.

(d) The Commissioner will establish fees for all other processing, services, or materials related to patents not specified above to recover the estimated average cost to the Office of such processing, services, or materials. The yearly fee for providing a library specified in section 13 of this title with uncertified printed copies of the specifications and drawings for all patents issued in that year will be $50.

(e) The Commissioner may waive the payment of any fee for any service or material related to patents in connection with an occasional or incidental request made by a department or agency of the Government, or any officer thereof. The Commissioner may provide any applicant issued a notice under section 132 of this title with a

copy of the specifications and drawings for all patents referred to in that notice without charge.

[(f) Fees will be adjusted by the Commissioner to achieve the levels of recovery specified in this section; however, no patent application processing fee or fee for maintaining a patent in force will be adjusted more than once every three times.]

(f) The fees established in subsections (a) and (b) of this section may be adjusted by the Commissioner on October 1, 1985, and every third year thereafter, to reflect any fluctuations occurring during the previous three years in the Consumer Price Index, as determined by the Secretary of Labor. Changes of less than 1 per centum may be ignored.

(g) No fee established by the Commissioner under this section will take effect prior to sixty days following notice in the Federal Register.

§ 42. Patent and Trademark Office funding

(a) All fees for services performed by or materials furnished by the Patent and Trademark Office will be payable to the Commissioner.

(b) All fees paid to the Commissioner and all appropriations for defraying the costs of the activities of the Patent and Trademark Office will be credited to the Patent and Trademark Office Appropriation Account in the Treasury of the United States, the provisions of section 725e of title 31, United States Code, notwithstanding.

(c) Revenues from fees will be available to the Commissioner of Patents to carry out, to the extent provided for in appropriation Acts, the activities of the Patent and Trademark Office. *Fees available to the Commissioner under section 31 of the Trademark Act of 1946, as amended (15 U.S.C. 1113), shall be used exclusively for the processing of trademark registrations and for other services and materials related to trademarks.*

(d) The Commissioner may refund any fee paid by mistake or any amount paid in excess of that required.

PART II—PATENTABILITY OF INVENTIONS AND GRANT OF PATENTS

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CHAPTER 11—APPLICATION FOR PATENT

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[§ 111. Application for patent

[Application for patent shall be made by the inventor, except as otherwise provided in this title, in writing to the Commissioner. Such application shall include: (1) a specification as prescribed by section 112 of this title; (2) a drawing as prescribed by section 113 of this title; and (3) an oath by the applicant as prescribed by section 115 of this title. The application must be signed by the applicant and accompanied by the fee required by law.]

SEC. 111. Application for patent shall be made, or authorized to be made, by the inventor, except as otherwise provided in this title,

in writing to the Commissioner. Such application shall include (1) a specification as prescribed by section 112 of this title; (2) a drawing as prescribed by section 113 of this title; and (3) an oath by the applicant as prescribed by section 115 of this title. The application must be accompanied by the fee required by law. The fee and oath may be submitted after the specification and any required drawing are submitted, within such period and under such conditions, including the payment of a surcharge, as may be prescribed by the Commissioner. Upon failure to submit the fee and oath within such pescribed period, the application shall be regarded as abandoned, unless it is shown to the satisfaction of the Commissioner that the delay in submitting the fee and oath was unavoidable. The filing date of an application shall be the date on which the specification and any required drawing are received in the Patent and Trademark Office.

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§ 115. Oath of applicant

The applicant shall make oath that he believes himself to be the original and first inventor of the process, machine, manufacture, or composition of matter, or improvement thereof, for which he solicits a patent; and shall state of what country he is a citizen. Such oath may be made before any person within the United States authorized by law to administer oaths, or, when, made in a foreign country, before any diplomatic or consular officer of the United States authorized to administer oaths, or before any officer having an official seal and authorized to administer oaths in the foreign country in which the applicant may be, whose authority [shall be] *is* proved by certificate of a diplomatic or consular officer of the United States, *or apostille of an official designated by a foreign country which, by treaty or convention, accords like effect to apostilles of designated officials in the United States,* and such oath shall be valid if it complies with the laws of the state or country where made. When the application is made as provided in this title by a person other than the inventor, the oath may be so varied in form that it can be made by him.

§ 116. [Joint inventors] *Inventors*

When an invention is made by two or more persons jointly, they shall apply for patent jointly and each sign the application and make the required oath, except as otherwise provided in this title.

If a joint inventor refuses to join in an application for patent or cannot be found or reached after diligent effort, the application may be made by the other inventor on behalf of himself and the omitted inventor. The Commissioner, on proof of the pertinent facts and after such notice to the omitted inventor as he prescribes, may grant a patent to the inventor making the application, subject to the same rights which the omitted inventor would have had if he had been joined. The omitted inventor may subsequently join in the application.

Whenever [a person is joined in an application for patent as joint inventor through error, or a joint inventor is not included in an application through error] *through error a person is named in*

an application for patent as the inventor, or through error an inventor is not named in an application, and such error arose without any deceptive intention on his part, the Commissioner may permit the application to be amended accordingly, under such terms as he prescribes.

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CHAPTER 16—DESIGNS

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§ 173. Term of design patent

[Patents for designs may be granted for the term of three years and six months, or for seven years, or for fourteen years, as the applicant, in his application, elects.]

Patents for designs shall be granted for the term of fourteen years.

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PART III—PATENTS AND PROTECTION OF PATENT RIGHTS

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CHAPTER 25—AMENDMENT AND CORRECTION OF PATENTS

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[§ 256. Misjoinder of inventor

[Whenever a patent is issued on the application of persons as joint inventors and it appears that one of such persons was not in fact a joint inventor, and that he was included as a joint inventor by error and without any deceptive intention, the Commissioner may, on application of all the parties and assignees, with proof of the facts and such other requirements as may be imposed, issue a certificate deleting the name of the erroneously joined person from the patent.

[Whenever a patent is issued and it appears that a person was a joint inventor, but was omitted by error and without deceptive intention on his part, the Commissioner may, on application of all the parties and assignees, with proof of the facts and such other requirements as may be imposed, issue a certificate adding his name to the patent as a joint inventor.

[The misjoinder or nonjoinder of joint inventors shall not invalidate a patent, if such error can be corrected as provided in this section. The court before which such matter is called in question may order correction of the patent on notice and hearing of all parties concerned and the Commissioner shall issue a certificate accordingly.]

§ 256. Correction of named inventor

Whenever through error a person is named in an issued patent as the inventor, or through error an inventor is not named in an issued patent and such error arose without and deceptive intention on his

part, the Commissioner may, on application of all the parties and assignees, with proof of the facts and such other requirements as may be imposed, issue a certificate correcting such error.

The error of omitting inventors or naming persons who are not inventors shall not invalidate the patent in which such error occurred if it can be corrected as provided in this section. The court before which such matter is called in question may order correction of the patent on notice and hearing of all parties concerned and the Commissioner shall issue a certificate accordingly.

CHAPTER 26—OWNERSHIP AND ASSIGNMENT

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§ 261. Ownership; assignment

Subject to the provisions of this title, patents shall have the attributes of personal property.

Applications for patent, patents, or any interest therein, shall be assignable in law by an instrument in writing. The applicant, patentee, or his assigns or legal representatives may in like manner grant and convey an exclusive right under his application for patent, or patents, to the whole or any specified part of the United States.

A certificate of acknowledgment under the hand and official seal of a person authorized to administer oaths within the United States, or, in a foreign country, of a diplomatic or consular officer of the United States or an officer authorized to administer oaths whose authority is proved by a certificate of a diplomatic or consular officer of the United States, *or apostille of an official designated by a foreign country which, by treaty or convention, accords like effect to apostilles of designated officials in the United States,* shall be prima facie evidence of the execution of an assignment, grant or conveyance of a patent or application for patent.

An assignment, grant or conveyance shall be void as against any subsequent purchaser or mortgagee for a valuable consideration, without notice, unless it is recorded in the Patent and Trademark Office within three months from its date or prior to the date of such subsequent purchase or mortgage.

CHAPTER 29—REMEDIES FOR INFRINGEMENT OF PATENT, AND OTHER ACTIONS

Sec.
281. Remedy for infringement of patent.

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294. Voluntary arbitration.

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§ 294. Voluntary arbitration

(a) A contract involving a patent or any right under a patent may contain a provision requiring arbitration of any dispute relating to patent validity or infringement arising under the contract. In the absence of such a provision, the parties to an existing patent validity or infringement dispute may agree in writing to settle such dispute by arbitration. Any such provision or agreement shall be valid, irrevocable, and enforceable, except for any grounds that exist at law or in equity for revocation of a contract.

(b) Arbitration of such disputes, awards by arbitrators and confirmation of awards shall be governed by title 9, United States Code, to the extent such title is not inconsistent with this section. In any such arbitration proceeding, the defenses provided for under section 282 of this title shall be considered by the arbitrator if raised by any party to the proceeding.

(c) An award by an arbitrator shall be final and binding between the parties to the arbitration but shall have no force or effect on any other person. The parties to an arbitration may agree that in the event a patent which is the subject matter of an award is subsequently determined to be invalid or unenforceable in a judgment rendered by a court to competent jurisdiction from which no appeal can or has been taken, such award may be modified by any court of competent jurisdiction upon application by any party to the arbitration. Any such modification shall govern the rights and obligations between such parties from the date of such modification.

(d) When an award is made by an arbitrator, the patentee, his assignee or licensee shall give notice thereof in writing to the Commissioner. There shall be a separate notice prepared for each patent involved in such proceeding. Such notice shall set forth the names and addresses of the parties, the name of the inventor, and the name of the patent owner, shall designate the number of the patent, and shall contain a copy of the award. If an award is modified by a court, the party requesting such modification shall give notice of such modification to the Commissioner. The Commissioner shall, upon receipt of either notice, enter the same in the record of the prosecution of such patent. If the required notice is not filed with the Commissioner, any party to the proceeding may provide such notice to the Commissioner.

(e) The award shall be unenforceable until the notice required by subsection (d) is received by the Commissioner.

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TRADEMARK ACT OF 1946

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Sec. 8 (a). Duration of registration—Cancelation at end of 6 years unless affidavit of use filed

Each certificate of registration shall remain in force for 20 years: *Provided,* That the registration of any mark under the provisions of this Act shall be canceled by the Commissioner at the end of 6 years following its date, unless within 1 year next preceding the expiration of such 6 years the registrant shall file in the Patient and Trademark Office an affidavit showing that said mark is **[**still**]** in use *in commerce* or showing that its nonuse is due to special circumstances which excuse such nonuse and is not due to any intention to abandon the mark. Special notice of the requirement for such affidavit shall be attached to each certificate of registration.

Sec. 8(b). Cancelation of republished prior registrations unless affidavit of use filed

Any registration published under the provisions of subsection (c) of section 12 of this Act shall be canceled by the Commissioner at the end of 6 years after the date of such publication unless within 1 year next preceding the expiration of such 6 years and registrant shall file in the Patent and Trademark Office an affidavit showing that said marks is **[**still**]** in use *in commerce* or showing that its nonuse is due to special circumstances which excuse such nonuse and is not due to any intention to abandon the mark.

* * * * * * *

Sec. II. Acknowledgments and vertifications

Acknowledgments and verifications required hereunder may be made before any person within the United States authorized by law to administer oaths, or, when made in a foreign country, before any diplomatic or consular officer of the United States or before any official authorized to administer oaths in the foreign country concerned whose authority **[**shall be**]** *is* proved by a certificate of a diplomatic or consular officer of the United States, *or apostille of an official designated by a foreign country which, by treaty or convention, accords like effect to apostilles of designated officials in the United States,* and shall be valid if they comply with the laws of the state or country where made.

* * * * * * *

Sec. 13. Opposition to registration of marks on the Principal Register

Any person who believes that he would be damaged by the registration of a mark upon the principal register may upon payment of the required fee, file **[**a verified**]** *an* opposition in the Patent and Trademark Office, stating the grounds therefor, within thirty days after the publication under subsection (a) of section 12 of this Act of the mark sought to be registered. Upon written request prior to the expiration of the thirty-day period, the time for filing opposition shall be extended for an additional thirty days, and further ex-

tensions of time for filing opposition may be granted by the Commissioner for good cause *when requested prior to the expiration of an extension.* The Commissioner shall notify the applicant of each extension of the time for filing opposition. [An unverified opposition may be filed by a duly authorized attorney, but such opposition shall be null and void unless verified by the opposer within a reasonable time after such filing to be fixed by the Commissioner.] An opposition may be amended under such conditions as may be prescribed by the Commissioner.

SEC. 14. A [verified] petition to cancel a registration of a mark, stating the grounds relied upon, may, upon payment of the prescribed fee, be filed by any person who believes that he is or will be damaged by the registration of a mark on the principal register established by this Act, or under the Act of March 3, 1881, or the Act of February 20, 1905—

(a) within five years from the date of the registration of the mark under this Act; or

(b) within five years from the date of publication under section 12(c) hereof of a mark registered under the Act of March 3, 1881, or the Act of February 20, 1905; or

(c) at any time if the registered mark becomes the common descriptive name of an article or substance, or has been abandoned, or its registration was obtained fraudulently or contrary to the provisions of section 4 or of subsections (a), (b), or (c) of section 2 of this Act for a registration hereunder, or contrary to similar prohibitory provisions of said prior Acts for a registration thereunder, or if the registered mark is being used by, or with the permission of, the registrant so as to misrepresent the source of the goods or services in connection with which the mark is used; or

(d) at any time if the mark is registered under the Act of March 3, 1881, or the Act of February 20, 1905, and has not been published under the provisions of subsection (c) of section 12 of this Act; or

(e) at any time in the case of a certification mark on the ground that the registrant (1) does not control, or is not able legitimately to exercise control over, the use of such mark, or (2) engages in the production or marketing of any goods or services to which the certification mark is applied, or (3) permits the use of the certification mark for purposes other than to certify, or (4) discriminately refuses to certify or to continue to certify the goods or services of any person who maintains the standards or conditions which such mark certifies:

Provided, That the Federal Trade Commission may apply to cancel on the grounds specified in subsections (c) and (e) of this section any mark registered on the principal register established by this Act, and the prescribed fee shall not be required.

Sec. 15. Incontestability under certain conditions of right to use mark

Except on a ground for which application to cancel may be filed at any time under subsections (c) and (e) of section 14 of this Act, and except to the extent, if any, to which the use of a mark registered on the principal register infringes a valid right acquired under the law of any State or Territory by use of a mark or trade

name continuing from a date prior to the date of [the publication] *registration* under this Act of such registered mark, the right of the registrant to use such registered mark in commerce for the goods or services on or in connection with which such registered mark has been in continuous use for 5 consecutive years subsequent to the date of such registration and is still in use in commerce, shall be incontestable: *Provided,* That—

(1) there has been no final decision adverse to registrant's claim of ownership of such mark for such goods or services, or to registrant's right to register the same or to keep the same on the register; and

(2) there is no proceeding involving said rights pending in the Patent Office or in a court and not finally disposed of; and

(3) an affidavit is filed with the Commissioner within 1 year after the expiration of any such 5-year period setting forth those goods or services stated in the registration on or in connection with which such mark has been in continuous use for such 5 consecutive years and is still in use in commerce, and the other matters specified in subsections (1) and (2) hereof; and

(4) no incontestable right shall be acquired in a mark which is the common descriptive name of any article or substance, patented or otherwise.

Subject to the conditions above specified in this section, the incontestable right with reference to a mark registered under this Act shall apply to a mark registered under the Act of March 3, 1881, or the Act of February 20, 1905, upon the filing of the required affidavit with the Commissioner within 1 year after the expiration of any period of 5 consecutive years after the date of publication of a mark under the provisions of subsection (c) of section 12 of this Act.

The Commissioner shall notify any registrant who files the above-prescribed affadavit of the filing thereof.

Sec. 16. Interference

[Whenever application is made for the registration of a mark which so resembles a mark previously registered by another, or for the registration of which another has previously made application, as to be likely when applied to the goods or when used in connection with the services of the applicant to cause confusion or mistake or to deceive, the Commissioner may declare that an interference exists.] *Upon petition showing extraordinary circumstances, the Commissioner may declare that an interference exists when application is made for the registration of a mark which so resembles a mark previously registered by another, or for the registration of which another has previously made application, as to be likely when applied to the goods or when used in connection with the services of the applicant to cause confusion or mistake or to deceive.* No interference shall be declared between an application and the registration of a mark the right to the use of which has become incontestable.

* * * * * * *

§ 31. Fees

(a) The Commissioner of Patents will establish fees for the filing and processing of an application for the registration of a trademark or other mark and for all other services performed by and materials furnished by the Patent and Trademark Office related to trademarks and other marks. [Fees will be set and adjusted by the Commissioner to recover in aggregate 50 per centum of the estimated average cost to the Office of such processing. Fees for all other services or materials related to trademarks and other marks will recover the estimated average cost to the Office of performing the service or furnishing the material.] However, no fee for the filing or processing of an application for the registration of a trademark or other mark or for the renewal or assignment of a trademark or other mark will be adjusted more than once every three years. No fee established under this section will take effect prior to sixty days following notice in the Federal Register.

(b) The Commissioner may waive the payment of any fee for any service or material related to trademarks or other marks in connection with an occasional request made by a department or agency of the Government, or any officer thereof. The Indian Arts and Crafts Board will not be charged any fee to register Government trademarks of genuineness and quality for Indian products or for products of particular Indian tribes and groups.

* * * * * * * *

Official Gazette Notice

Filing Of Verified Statements Claiming Small Entity Status

In view of the fact that the rules implementing the definition of small business concern were not published in the Federal Register until September 30, 1982, any verified statement claiming small entity status will be accepted as timely filed if (1) the first fee in a patent application has been paid on or after October 1, 1982, but before February 27, 1983, in the amount established for a non-small entity and (2) such verified statement is filed within 3 months of the date of payment of the first fee in a patent application paid on or after October 1, 1982, but before February 27, 1983. If such a verified statement is timely filed within three months of the date of payment of the first fee paid on or after October 1, 1982, but before February 27, 1983, the statement will be treated as though it were present on the date the fee was paid. The correct amount of the fee will be determined and any excess will be refunded upon request. Section 1.28(a) of 37 CFR is waived until February 27, 1983 to the extent it is inconsistent with this practice.

10-15-82
Date

Donald J. Quigg

Acting Commissioner of Patents & Trademarks

PATENT NOTICES

Certificates of Correction for the Week of Oct. 26, 1982

Re. 30,789	4,303,168	4,336,145	4,342,978
Re. 30,846	4,304,038	4,336,741	4,343,134
Re. 30,945	4,306,087	4,336,966	4,343,487
Re. 30,948	4,306,111	4,336,999	4,343,568
Re. 30,995	4,309,964	4,337,023	4,343,956
Re. 31,015	4,310,044	4,337,433	4,344,053
D. 263,808	4,310,330	4,337,441	4,344,124
D. 265,283	4,310,791	4,337,521	4,344,727
3,798,543	4,313,883	4,337,675	4,344,744
3,826,675	4,313,948	4,337,794	4,345,140
3,840,457	4,317,302	4,337,872	4,345,238
4,045,459	4,318,531	4,338,037	4,345,286
4,097,453	4,320,848	4,338,321	4,345,294
4,128,357	4,320,982	4,338,383	4,345,484
4,152,459	4,321,349	4,338,695	4,345,908
4,166,979	4,321,596	4,338,922	4,345,959
4,170,270	4,321,894	4,339,267	4,346,011
4,170,665	4,322,215	4,339,350	4,346,122
4,180,667	4,322,306	4,339,405	4,346,267
4,185,190	4,322,700	4,339,417	4,346,355
4,202,984	4,326,047	4,339,572	4,346,392
4,213,132	4,327,356	4,339,822	4,346,430
4,216,533	4,327,703	4,340,322	4,346,435
4,224,633	4,328,037	4,340,406	4,346,436
4,225,508	4,328,061	4,340,451	4,346,748
4,238,820	4,328,088	4,340,459	4,346,759
4,245,611	4,328,298	4,340,508	4,346,777
4,249,486	4,328,558	4,340,556	4,346,848
4,253,015	4,328,812	4,340,821	4,346,919
4,264,436	4,329,381	4,340,949	4,347,250
4,265,846	4,329,642	4,341,185	4,347,406
4,266,504	4,329,863	4,341,187	4,347,432
4,271,288	4,329,906	4,341,601	4,347,518
4,276,298	4,330,353	4,341,900	4,347,546
4,276,579	4,331,285	4,341,992	4,347,727
4,277,525	4,332,299	4,342,092	4,347,820
4,284,467	4,332,523	4,342,247	4,347,963
4,285,411	4,333,064	4,342,338	4,347,993
4,292,150	4,333,464	4,342,529	4,348,377
4,294,938	4,333,513	4,342,555	4,348,588
4,298,793	4,335,234	4,342,651	
4,302,498	4,335,681	4,342,911	

Disclaimers

3,388,755.—*Derrel D. Webb,* Houston, Texas. COMBINATION SHOCK ABSORBER AND JAR. Patent dated May 2, 1966. Disclaimer filed Feb. 26, 1979, by the assignee, *Houston Engineers, Inc.*

Hereby enters this disclaimer to all claims of said patent.

3,396,542.—*Bruce A. Lamberton,* Berea, Ohio. METHOD AND ARRANGEMENTS FOR PROTECTING SHORELINES. Patent dated Aug. 13, 1968. Disclaimer filed Mar. 17, 1982, by the inventor.

The term of this patent subsequent to Aug. 13, 1985 has been disclaimed.

3,867,822.—*Lynn H. Morse,* Venice, Fla. and *Anker J. Nielsen, Jr.,* Holden, Mass. LOCKING MEANS FOR ELECTRIC METERS. Patent dated Feb. 25, 1975. Disclaimer filed Aug. 26, 1982, by the assignee, *Omco, Inc.*

Hereby enters this disclaimer to all claims of said patent.

3,876,498.—*Edgar J. Justus,* Beloit, Wis. CONTROLLED FORMING WIRE SEPARATION ON IMPERVIOUS ROLL OF TWIN-WIRE PAPERMAKING MACHINE. Patent dated Apr. 8, 1975. Disclaimer filed Aug. 7, 1981, by the assignee, *Beloit Corp.*

Hereby enters this disclaimer to all claims of said patent.

4,028,433.—*Richard Prinz,* Leverkusen; *Salah Elabd Elghani,* Duesseldorf; *Windried Fischer,* Cologne and *Heinrich Alberts,* Cologne, Germany. THERMOPLASTIC MOULDING COMPOUNDS. Patent dated June 7, 1977. Disclaimer filed Sept. 7, 1982, by the assignee, *Bayer Aktiengesellschaft.*

Hereby enters this disclaimer to all claims of said patent.

4,125,777.—*James T. O'Brien,* Leola; *Albert C. Limm,* Lancaster; *Paul Nyul,* New Holland and *Vincent S. Tassia, Jr.,* York, PA. RADIATION EMITTER-DETECTOR PACKAGE. Patent dated Nov. 14, 1978. Disclaimer filed June 22, 1982, by the assignee, *RCA Corp.*

Hereby enters this disclaimer to all claims of said patent.

4,141,691.—*Joseph M. Antonetti,* Burgettstown, PA. and *Glen F. Snow,* Birmingham, Ala. USE OF WATER SOLUBLE POLYMERS IN COAL FLOTATION CIRCUITS. Patent dated Feb. 27, 1979. Disclaimer filed Aug. 8, 1980, by the assignee, *Calgon Corp.*

Hereby enters this disclaimer to all claims of said patent.

4,150,074.—*Peter J. Tilgner,* Akron, Ohio. METHOD OF EFFECTING MULTI-STATION IN-PLACE REACTION INJECTION MOLDING ALL FOAMABLE REACTIVE POLYMERIC RESIN COMPOSITION. Patent dated Apr. 17, 1979. Disclaimer filed Jan. 7, 1982, by the assignee, *The Upjohn Co.*

Hereby enters this disclaimer to claim 1 of said patent.

4,162,504.—*Sheng T. Hus,* Lawrenceville, New Jersey, FLOATING GATE SOLID-STATE STORAGE DEVICE. Patent dated July 24, 1979. Disclaimer filed Aug. 2, 1982, by the assignee, *RCA Corp.*

Hereby enters this disclaimer to claims 1–7 of said patent.

4,265,915.—*Mary E. MacLennan* and *Martial Lawson,* New South Wales, Australia. PROTEIN-CONTAINING FOOD MATERIAL. Patent dated May 5, 1981. Disclaimer filed Sep. 9, 1982, by the assignee, *Bioenterprises Pty. Ltd.*

Hereby enters this disclaimer to claim 29 of said patent.

4,339,156.—*Richard E. Livesay,* Peoria, Ill., ROLLER-IDLER ASSEMBLY FOR CRAWLER UNDERCARRIAGE. Patent dated July 13, 1982. Disclaimer filed Aug. 23, 1982, by the assignee, *Caterpillar Tractor Co.*

Hereby enters this disclaimer to claim 12 of said patent.

Dedications

3,597,121.—*Samuel B. McClocklin,* Owatonna, Minn. AIR-DRIVEN HYDRAULIC PUMP. Patent dated

Aug. 3, 1971. Dedication filed May 14, 1980, by the assignee, *Owatonna Tool Co.*

Hereby dedicates to the public the entire term of said patent.

3,616,114.—*Tsuneji Hamaguchi,* Osaka and *Hajimu Tanaka* Suita-City, Japan. REUSABLE COMPOSITE ADHESIVE SEALING TAPES. Patent dated October 26, 1971. Dedication filed Aug. 27, 1982, by the assignee, *The Procter & Gamble Co.*

Hereby dedicates to the public the entire term of said patent.

4,308,364.—*Kishore Udipi,* East Longmeadow, Mass. LACTONES FROM GAMMA-HYDROXY ACIDS AS COUPLING AGENTS. Patent dated Dec. 29, 1981. Dedication filed Aug. 9, 1982, by the assignee, *Phillips Petroleum Co.*

Hereby dedicates to the public the entire remaining term of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4559
Illinois	Chicago Public Library	(312) 269-2865
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6552
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214, 215
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7814
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

**Call only between the hours of 10:00 a.m. and 5:00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF September 4, 1982

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	10-06-80
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	9-17-80
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	5-13-81
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	4-20-81
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-09-81
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	9-12-80
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	9-18-80
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-30-80
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	7-30-80
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	11-26-79
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	7-21-80
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	12-12-80
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director ... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	11-05-80
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	2-13-80
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	8-14-80
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	7-25-80

Expiration of patents: The patents within the range of numbers indicated below expire during September 1982, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,204,251 to 3,209,368, inclusive

Plant Patents ..... Numbers 2,552 to 2,557 inclusive

PATENT EXAMINING CORPS

BENJ. D. PRENTISS, Assistant Commissioner

WILLIAM PELHAM, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS as OF September 6, 1902

PATENT EXAMINER'S ORDER

REEXAMINATIONS

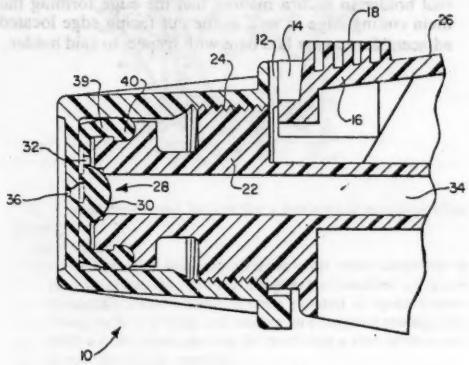
OCTOBER 26, 1982

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination

B1 4,257,561 (27th)
CHILD-RESISTANT DISPENSING NOZZLE ASSEMBLY

James C. McKinney, Alpharetta, Ga., assignor to Ethyl Products Company, Richmond, Va.

Reexamination Request No. 90/000,045, Aug. 4, 1981.
Reexamination Certificate for Patent No. 4,257,561, issued Mar. 24, 1981, Ser. No. 45,637, Jun. 5, 1979.
U.S. 239/58. Int. Cl.³ B05B 1/30



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **3**, having been finally determined to be unpatentable is cancelled.

Claims 1, 4, and 6 are determined to be patentable as amended.

1. A child-resistant nozzle assembly for a liquid dispenser comprising:

a. nozzle means having a downstream end and an upstream end and being generally hollow inside, said nozzle means having slot means in the upstream end, said nozzle means having thread means thereon which engage thread means [on said] *provided on a dispenser* body means for connecting said nozzle means to said *dispenser* body means;

b. *said* dispenser body means [connectable to said nozzle means] having lug means flexibly connected thereto for selective receipt within said slot means to prevent said nozzle means from turning when said lug means is received in said slot means;

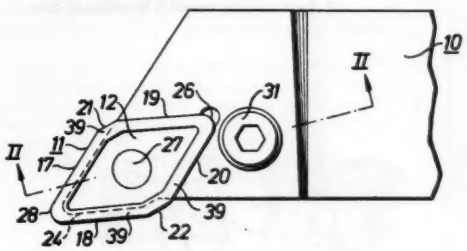
c. conduit means in said dispenser body means for supplying liquids to said nozzle means; and

d. flexible valve means located between said nozzle means and said conduit means [.], *said valve means being adapted to make contact with said nozzle means to force said valve means to close said conduit means to prevent liquids from escaping from said nozzle means when said lug means is received in said slot means.*

B1 3,848,303 (28th)
CUTTING INSERT AND CUTTING TOOL ASSEMBLY

Kurt Heinrich Albert Erich Faber, Sandviken, Sweden, assignor to Sandvikens Jernverks Aktiebolag, Sandviken, Sweden.

Reexamination Request No. 90/000,148, Jan. 27, 1982.
Reexamination Certificate for Patent No. 3,848,303, issued Nov. 19, 1974, Ser. No. 379,205, Jul. 16, 1973.
U.S. Cl. 407/77 Int. Cl.³ B26D 1/00



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–4 is confirmed.

1. A tool holder and cutting insert combination for copy turning consisting of a tool holder (**10**) and a basically rhombic insert (**11**), said insert having edge portions (**21, 22**) which separate pairs of edges (**17** and **18** from **19** and **20**) extending towards the cutting tips and which extend symmetrically relative to the longest diagonal and substantially parallel thereto, at least one of a pair of edges extending to one cutting tip being formed as a main cutting edge and the insert having substantially flat side surfaces (**12, 13**) being located at a right angle of the intersection of the edge surfaces (**14, 15, 16**), means being disposed in said holder to securely clamp the insert against a bottom supporting surface of basically rhombic configuration and complementary side supports in a recess in said holder, characterized in that the recess is formed in such a manner that, with the insert clamped in position in the holder **10**, the edge forming the main cutting edge (**18**) as well as the edge forming the out-facing cutting edge (**22**) located adjacent thereto are laid bare in their entirety with respect to said holder **10** for enabling those two cutting edges (**18, 22**) to be brought into cutting engagement with a workpiece.

B1 3,777,341 (29th)

CUTTING INSERT AND CUTTING TOOL ASSEMBLY

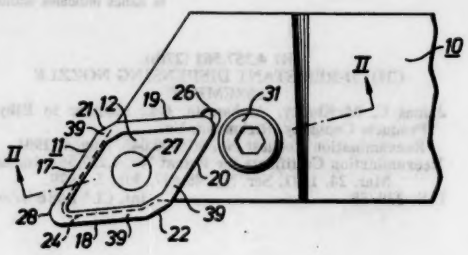
Kurt Heinrich Albert Erich Faber, Sandviken, Sweden assignor to Sandvik Aktiebolag, Sandviken, Sweden

Reexamination Request No. 90/000,149, Jan. 27, 1982.
Reexamination Certificate for Patent No. 3,777,341, issued Dec. 11, 1973, Ser. No. 257,530, May 30, 1972.
U.S. Cl. 407/114 INT. Cl.[3] B26D 1/00

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–7 is confirmed.

1. A copy turning indexible cutting insert having cutting tip angles below 60°, the cutting insert **11** being basically of rhombic configuration and having edge portions **21, 22** which separate the edges **17, 18, 19, 20** extending towards the cutting tips and which extend symetrically relative the longest diagonal and substantially parallel thereto, at least one of two edges extending to one cutting tip being formed as a main cutting edge and the insert having substantially flat side surfaces **12, 13** being located at a right angle at the intersection of the edge surfaces, **14, 15, 16,** characterized in that each of said parallel edge portions **21, 22** is formed as an out-facing cutting edge for co-operation with the main cutting edge **18, 19** located adjacent thereto, and said main cutting edges and said outfacing cutting edges being provided with chip breaking grooves **39, 40**



said insert being adapted for engagement in a recess in a tool holder in such a manner that the edge forming the main cutting edge as well as the out-facing edge located adjacent thereto are laid bare with respect to said holder.

REISSUES

OCTOBER 26, 1982

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,063

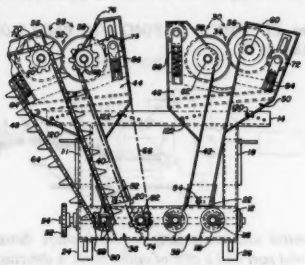
ADJUSTABLE WIDTH ROW CROP HEADER

James G. Greiner, Leola; John E. Breisford, Terre Hill, and Louis R. Thomas, Jr., New Holland, all of Pa., assignors to Sperry Corporation, New Holland, Pa.

Original No. 4,086,749, dated May 2, 1978, Ser. No. 714,534, Aug. 16, 1976. Application for reissue Sep. 5, 1980, Ser. No. 184,600

Int. Cl.[3] A01D *45/02*

U.S. Cl. 56—98 11 Claims



1. A multi-row crop header for a harvesting machine comprising:

(a) a frame;

(b) a plurality of fore-and-aft row crop units adaptable to receive respective rows of crop as the machine advances forwardly over a field of crop planted in spaced apart rows, each row crop unit having an elongated passageway with a front inlet opening for receiving a row of crop and a rear discharge opening;

(c) means for pivotally mounting each row crop unit individually on said frame for [laterally] *lateral* movement relative to the forward direction of travel whereby the lateral spacing between said front inlet openings of said respective row crop units may be varied to receive rows of crop planted in a plurality of different row widths;- [and]

(d) means for fastening said respective row crop units in a plurality of laterally spaced positions corresponding to said plurality of different row [widths.] *width; and*

(e) an adjustable divider mounted on said frame and pivotally interconnecting two adjacent row crop units to guide crop into said adjacent row crop units, the width of each said divider being telescopically adjustable in a scissors-like manner to accommodate the variable spacing between the front inlet openings of said adjacent row crop units.

Re. 31,064

ADJUSTABLE WIDTH ROW CROP HEADER

Joe E. Shriver, New Holland, Pa., assignor to Sperry Corporation, New Holland, Pa.

Original No. 4,086,749, dated May 2, 1978, Ser. No. 714,534, Aug. 16, 1976. Application for reissue Sep. 5, 1980, Ser. No. 184,599

Int. Cl.[3] A01D *14/02*

U.S. Cl. 56—98 11 Claims

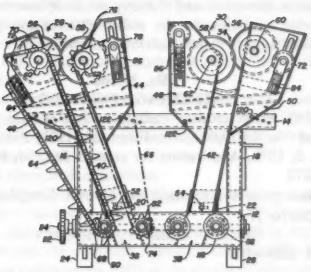
1. A multi-row crop header for a harvesting machine comprising:

(a) a frame;

(b) a plurality of fore-and-aft row crop units adaptable to receive respective rows of crop as the machine advances forwardly over a field of crop planted in spaced apart rows, each row crop unit having an elongated passageway with a front inlet opening for receiving a row of crop and a rear discharge opening, *said elongated passageway being defined by a channel member extending between said front inlet opening and said rear discharge opening;*

(c) means for pivotally mounting each row crop unit individually on said frame for [laterally] *lateral* movement relative to the forward direction of travel whereby the lateral spacing between said front inlet openings of said respective row crop units may be varied to receive rows of crop planted in a plurality of different row widths [and], *said means for mounting including a mounting bracket affixed to said frame, each said channel member having a rearward end adjacent to the corresponding rear discharge opening, said rearward end of each said channel member being pivotally attached to the corresponding mounting bracket;*

(d) means for fastening said respective row crop units in a plurality of laterally spaced positions corresponding to said plurality of different row widths[.]*;*



(e) gathering means associated with each of said row crop units for conveying crop rearwardly toward said rear discharge opening, said gathering means including a pair of drive sprockets, a pair of driven sprockets and a pair of idler sprockets, said drive sprockets being rotatably mounted on said frame and being disposed on opposite sides of each of said elongated passageways proximate to said rear discharge opening, said drive sprockets being mounted in a fixed position relative to said frame, said driven sprockets being mounted on opposite sides of each of said elongated passageways adjacent said front inlet opening, each said gathering means further including a pair of flexible elements operable positioned on opposing sides of said elongated passageway, each said flexible element cooperating with the corresponding drive sprocket, driven sprocket and idler sprocket to engage crop material and convey it rearwardly along said passageway; and

(f) drive means for powering said drive sprockets.

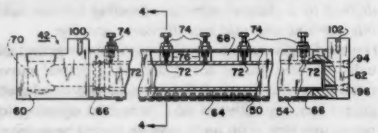
Re. 31,065
STEAM DISTRIBUTION SYSTEM

Clifford D. Shelor, Charleston, S.C., assignor to Westvaco Corporation, New York, N.Y.

Original No. 3,574,338, dated Apr. 13, 1971, Ser. No. 877,615, Nov. 18, 1969. Application for reissue Apr. 7, 1980, Ser. No. 137,568

Int. Cl.³ B05B *1/14*; D21F *5/18*

U.S. Cl. 239—120 **15 Claims**



1. Apparatus for distributing steam *onto a traveling paper machine web* comprising:

a. *first* means forming a *single, continuous* chamber *space extending substantially across the width dimension of said web and* having a multiplicity of steam distribution outlets spaced *uniformly* along a *surface* portion of [its surface] *said first means adjacent said web*

b. *second* means forming a [plurality] *multiplicity* of steam supply ports [in], *each port having individual* fluid communication with diverse portions of said chamber *space*; and

c. *third* means for variably regulating the passage of steam through at least a number of said ports individually to effect *continuously transitioned* variation in the distribution of steam throughout said chamber *space* as such steam passes thereinto and thereby produce *continuously transitioned* variation in the steam distribution profile established at said steam distribution outlets.

Re. 31,066
STEERING LINKAGES

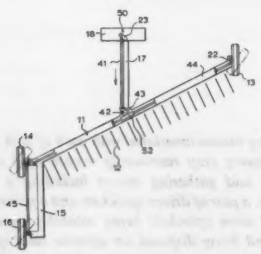
Donald G. M. Whittaker, Ballasalla, Isle of Man

Original No. 4,070,031, dated Jan. 24, 1978, Ser. No. 673,431, Apr. 5, 1976. Application for reissue Jan. 24, 1980, Ser. No. 115,072

Claims priority, application United Kingdom, May 13, 1975, 20070/75

Int. Cl.³ B62D *7/00*; A01B *69/08*

U.S. Cl. 280—103 **4 Claims**



1. In a steering linkage for a trailer vehicle or implement comprising a frame and steerable wheels mounted on the frame wherein the improvement comprises a transverse frame member, a bar slidably mounted on the said transverse frame member, a rack formed on the said bar, a pinion rotatably mounted in the transverse frame member in mesh with the said rack, means for rotating said pinion comprising a link [rod, said link rod] *means* interconnected with said pinion, the rotation of the pinion imparting sliding motion to the bar, and means for linking the bar and the steerable wheels whereby sliding motion of the bar provides rotary motion to the steerable wheels, a forwardly extending frame member, means for connecting said forwardly extending frame member to said transverse frame [at the mid-point of said transverse frame,], a crossmember adapted to be connected to a trailer hitch, and means for pivotally connecting said forwardly extending frame member to said crossmember.

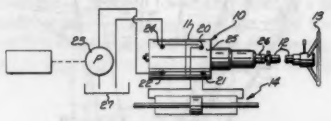
Re. 31,067
HYDROSTATIC CONTROL UNIT

Maurice P. Roberts, Otterbein, Ind., assignor to TRW Inc., Cleveland, Ohio

Original No. 3,895,888, dated Jul. 22, 1975, Ser. No. 407,776, Oct. 19, 1973. Application for reissue Jul. 20, 1977, Ser. No. 817,177

Int. Cl.³ F01C *1/10*; F04C *2/10*; B62D *5/08*

U.S. Cl. 418—61 B **37 Claims**



36. A control unit comprising an input shaft, housing means having an inlet port and a pair of outlet ports, a directional control valve means for porting fluid from said inlet port selectively to one of said outlet ports, said directional control valve means comprising a fixed valve means and a controlling valve member movable through a predetermined limited distance relative to said fixed valve member to control fluid flow therethrough, and metering means in said housing interconnecting said input shaft and said controlling valve member for moving said controlling valve member said limited distance in response to initial rotation of said input shaft and for directing fluid flow to said directional control valve as said shaft rotates, said metering means comprising a gerotor mechanism having an internally toothed gerotor member and an externally toothed gerotor member, means connecting said input shaft to one of said gerotor members for rotation with said shaft, and means connecting the other of said gerotor members with said controlling valve member to move said controlling valve member, said other gerotor member being rotatable about its central axis in response to initial rotation of said one gerotor member to effect movement of said controlling valve member and said valve members constraining said other gerotor member to then orbit only relative to said one gerotor member during continued rotation of said one gerotor member by rotation of said input shaft when the force applied to said controlling valve member is not sufficient to move same.

Re. 31,068
SUBSTITUTED BENZOTHIAZOLINES AND THEIR USE AS PLANT GROWTH REGULANTS

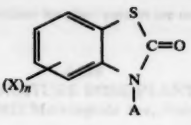
John J. D'Amico, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Original No. 4,160,658, dated Jul. 10, 1979, Ser. No. 839,875, Oct. 6, 1977. Division of Ser. No. 735,658, Oct. 26, 1976, Pat. No. 4,075,216. Application for reissue Oct. 24, 1979, Ser. No. 88,212

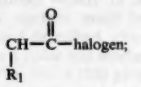
Int. Cl.³ A01N *43/78*

U.S. Cl. 71—90 **39 Claims**

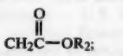
1. A composition for regulating the growth of soybean plants consisting essentially of a compound having the formula



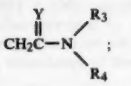
wherein A is selected from the group consisting of



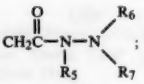
(I)



(II)



(III)



(IV)

wherein R_1 is selected from the group consisting of hydrogen and lower alkyl; X is halogen; Y is selected from the group consisting of oxygen and sulfur; R_2 is selected from the group consisting of lower alkenyl, monohalo lower alkenyl, dihalo lower alkenyl, trihalo lower alkenyl, lower alkynyl, benzyl and benzyl optionally substituted by up to three substituents selected from the group consisting of lower alkyl, trifluoromethyl and halogen; R_3 is selected from the group consisting of [hydrogen, lower alkenyl, lower alkynyl,] pyridyl[,] *and* pyridyl[;] substituted by halogen; R_4 is [selected from the group consisting of] hydrogen [and lower alkenyl]; R_5 is selected from the group consisting of hydrogen and lower alkyl; R_6 and R_7 are independently selected from the group consisting of hydrogen, phenyl and lower alkyl; n is 0 or 1; provided that R_3 and R_4 may both be hydrogen only when Y is sulfur; further provided that R_6 may not be hydrogen when R_7 is hydrogen; the remaining parts being composed of one or more suitable diluents, carriers and/or adjuvants.

Re. 31,069

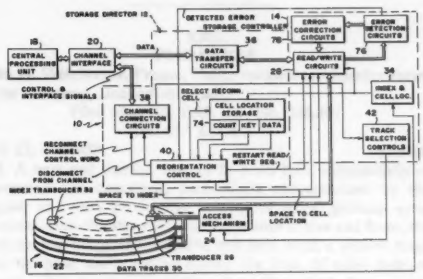
APPARATUS AND METHOD FOR RECORD REORIENTATION FOLLOWING ERROR DETECTION IN A DATA STORAGE SUBSYSTEM

Henry K. Chang, and Wolfgang H. Hausen, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Original No. 4,209,809, dated Jun. 24, 1980, Ser. No. 940,949, Sep. 11, 1978. Application for reissue Nov. 26, 1980, Ser. No. 210,631

Int. Cl.³ G11B *5/09*

U.S. Cl. 360—53 **12 Claims**



5. A method of reorienting a transducer within a cyclically repeating track having a succession of different *failure independent* fields recorded therein, different groups of the fields defining a succession of different records *each of which has a unique address independent of its physical location* along the track, comprising the steps of:

providing an indication of the location of each *failure independent* field relative to a common reference location on the track;

moving the transducer in a given direction along the track;

identifying the indication of the location of the last *failure independent* field presented to the transducer upon the occurrence of an error;

storing the identified indication;

terminating data processing at the transducer upon the occurrence of an error;

advancing the transducer relative to the track in the given direction past the common reference location [to] g *and any failure independent fields in the record in error preceding* the *precise* field the indication of which was stored; and *only thereafter* attempting to continue data processing at the transducer.

PLANT PATENTS

GRANTED OCTOBER 26, 1982

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,898

MINIATURE ROSE PLANT

Leslie E. Strawn, 10422 Morningside Ave., Garden Grove, Calif. 92643

Filed Mar. 9, 1981, Ser. No. 241,759
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—9 1 Claim

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, upright, much branched habit, substantially as illustrated and described, characterized by buds and flowers which are in a color hue similar to Stacey Sue (miniature — U.S. Plant Pat. No. 4,158) giving a coloring effect of blended shades of pink with coral undertones and resembling Peaches 'N Cream (miniature — U.S. Plant Pat. No. 4,278) in form and size, having buds and flowers of a distinct and unusual appearance as compared to other miniature rose plants; said flowers being fully double, uniquely formed with high centers; and further characterized by its vigor, abundant foliage and ease of propagation from soft wood cuttings and by budding, and with an abundance of flowers.

4,899

ROSE PLANT—75-20364

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Co., Medford, Oreg.

Filed Dec. 22, 1980, Ser. No. 218,730
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—14 1 Claim

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its vigorous, upright plant producing blunt top buds of very white petals, occasionally having green streaks on outer petals.

4,900

APPLE TREE

William P. Marsland, Rte. 3, Box 166, Spring Hill, Kans. 66083

Filed Oct. 16, 1980, Ser. No. 197,640
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—34 1 Claim

1. A new and distinct variety of apple tree substantially as herein shown and described characterized particularly as to novelty by the unique combination of the general resemblance to the variety Stayman apple (unpatented) but having fruit that ripens under normal conditions approximately 5–10 days ahead of the standard variety that is a brighter red color with less prominent dots borne on a tree which is smaller and more open growing with more fruiting spurs than known Stayman variety, a tendency to fruit, especially in younger trees, on one year old wood, much more waxy skin than the standard variety of Stayman apple which increases resistance to cracking and enhances shelf storage life.

4,901

SPUR TYPE WINTER BANANA APPLE TREE—FRECON CULTIVAR

Richard S. Frecon, Boyertown, Pa., assignor to Stark Brothers Nurseries & Orchards Company, Louisiana, Mo.

Filed Jan. 12, 1981, Ser. No. 224,628
Int. Cl.[3] A01H *5/03*
U.S. Cl. Plt.—34 1 Claim

1. A new and distinct variety of winter banana apple tree, substantially as illustrated and described, characterized by (a) a vigorous compact upright growth habit with only a slightly spreading tendency, (b) the ability to heavily bear fruit having a whitish-yellow skin color upon maturity which is substantially identical to that of the standard winter banana apple tree and which has substantially less skin russeting than the fruit of the Housden spur type winter banana apple tree, (c) the ability to form large long green leaves, and (d) the propensity to form more fruit spurs per unit length of two and three year old wood than the standard winter banana apple tree and less spurs per unit length of two and three year old wood than the Housden spur type winter banana apple tree.

4,902

PLUM TREE

John H. Weinberger, Fresno, Calif., assignor to Superior Farming Company, Bakersfield, Calif.

Filed Mar. 23, 1981, Ser. No. 246,301
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—38 1 Claim

1. A new and distinct variety fo plum tree, substantially as illustrated and described, particularly characterized by the regular and very productive bearing of large, globose, symmetrical, semi-freestone fruit uniform both in size and form, the fruit having burgundy red skin, red flesh with a yellow tinge near the base, and a red pit cavity; the fruit, of mild, delicate flavor, most nearly resembling the yellow-flesh fruit of the Queen Ann but ripens approximately a week earlier, and also somewhat earlier than the red-flesh fruit of the Frontier.

4,903

PEACH TREE

John H. Weinberger, Fresno, Calif., assignor to Superior Farming Company, Bakersfield, Calif.

Filed Apr. 10, 1981, Ser. No. 253,161
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—43 1 Claim

1. A new and distinct variety of peach tree, substantially as illustrated and described, particularly characterized by the bearing of uniform, medium size, symmetrical, globose, freestone fruit having yellow skin blushed with medium light red, and yellow flesh; the fruit ripening about a week later than Springcrest, and about three weeks earlier than Flavorcrest.

4,904

GREEN ASH TREE

Paul L. Bergeson, Rte. 1, Fertile, Minn. 56540

Filed Jun. 20, 1980, Ser. No. 161,648
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—51 1 Claim

1. A new and distinct variety of green ash tree, substantially as shown and described herein, characterized particularly as to novelty by the unique combination of a rapid, straight, quick-branching, vigorous, upright, uniform and seedless growth habit which requires little or no pruning to produce a desirable nursery-grown tree for commercial sale in a minimum of growing time, with narrow glossy green leaves, an attractive bronze-color bark, a pronounced stronger caliper, a tendency to branch the first year of growth, and with leaves which stay on the tree longer in the autumn.

4,905

RHODODENDRON PLANT—HACPUT VARIETY

Johannes Hachmann, Barmstedt in Holstein, Fed. Rep. of Germany, assignor to Conard-Pyle Company, West Grove, Pa.

Filed Jun. 25, 1980, Ser. No. 162,916
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—55 1 Claim

1. A new and distinct variety of *Rhododendron russatum,* substantially as herein shown and described, characterized particularly as to novelty by the unique combination of:

(a) a bushy, well-branched and vigorous growth habit,
(b) flowers of striking violet-blue color,
(c) improved hardiness compared to the *russatum* species, and
(d) improved tolerance to extremes of both cold and heat when compared to the Blue Tit and Blue Diamond varieties and varieties of the *impeditum* species.

4,906

LILY NAMED TEMPO

Ted T. Kirsch, Myrtle Point, Oreg., assignor to Sun Valley Bulb Farms, Inc., Myrtle Point, Oreg.

Filed Dec. 11, 1980, Ser. No. 215,233
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct variety of oriental hybrid lily plant substantially as herein shown and described, characterized by its large, brilliant, reddish purple, outwardly facing flowers borne on strong, stiff pedicels, and by its dark green, glossy foliage.

4,907

MINIATURE CARNATION

Angelo J. Siri, 825 Woolsey St., San Francisco, Calif. 94134

Filed Feb. 9, 1981, Ser. No. 232,893
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—70 1 Claim

1. A new and distinct variety of miniature carnation plant, substantially as herein shown and described.

4,908

CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., 639 Summit St., P.O. Box 112, Doylestown, Ohio 44230; William E. Duffett, 2632 Ira Rd., Akron, Ohio 44313, and Marvin D. Mix, P.O. Box 308, Bend, Oreg. 97701

Filed Mar. 7, 1972, Ser. No. 232,393
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—79 1 Claim

1. A new and distinct cultivar of chrysanthemum characterized particularly as to uniqueness when compared to the parent cultivar bronze Princess Anne and its closely related cultivar Gay Anne by its more intense flower color, with more red tones, its relatively slower fading characteristic, and its more attractive flower color when faded.

4,909

CHRYSANTHEMUM NAMED CHERRY WESTLAND

Jacques C. M. van der Knaap, De Lier, Netherlands, assignor to Pan-American Plant Company, Parrish, Fla.

Filed Oct. 2, 1980, Ser. No. 193,090
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—79 1 Claim

1. A new and distinct chrysanthemum cultivar, substantially as herein shown and described, characterized particularly by the unique bronze coloration of its flowers.

PATENTS

GRANTED OCT. 26, 1982

ERRATA

For CLASS	See PATENT NO.
237–012	4,355,752
237–012	4,355,753
238–083	4,355,754
376–254	4,356,061
376–272	4,356,062
524–837	4,356,116
549–475	4,356,125
373–107	4,356,340
378–138	4,356,400

PATENTS

(GRANTED OCT. 26, 1982)

ERRATA

PATENTS

GRANTED OCTOBER 26, 1982

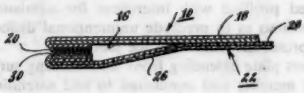
GENERAL AND MECHANICAL

4,355,424

X-RAY GLOVES AND LINER

William J. McCoy, Jr., 26 Quarry Rd., Stamford, Conn. 06903

Filed Sep. 2, 1980, Ser. No. 182,955
Int. Cl.³ A41D *19/00*
U.S. Cl. 2—161 R **9 Claims**



1. Apparatus for protecting the human hand from radiation comprising

an outer glove made from radiation barrier material, the innermost surface of which is smooth and has a low coefficient of friction,

and a removeable laminated liner for said glove, the outer lamination of which liner has a high coefficient of friction with respect to said innermost surface of said glove, and the inner lamination of which is moisture absorbent,

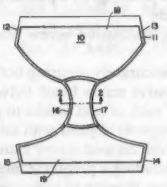
said apparatus including means for removeably affixing the interior of said glove in the cuff region thereof to the exterior of said liner in the cuff region thereof.

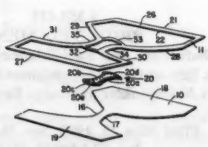
4,355,425

PANTY WITH A BUILT-IN ELASTIC SYSTEM TO MINIMIZE GATHERING AND PROVIDE A COMFORTABLE, CONFORMING FIT AND METHOD TO ASSEMBLE A PANTY

Bradley N. Jones, Cerritos, Calif., and Lawrence H. Sanford, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 1, 1980, Ser. No. 117,427
Int. Cl.³ A41B *9/02, 9/04*
U.S. Cl. 2—402 **8 Claims**





1. A nongathered panty comprising a porous fabric panel means and elastic member means defining waist and leg openings wherein said fabric panel means and said elastic member means are manufactured from a nonwoven material which is elastic in all directions said fabric panel means and said elastic member means being manufactured from a nonwoven material and having the same composition.

4,355,426

POROUS FLEXIBLE VASCULAR GRAFT

David C. MacGregor, 81 Wimbleton Rd., Islington, Ontario, Canada

Division of Ser. No. 824,296, Aug. 15, 1977, which is a continuation-in-part of Ser. No. 683,382, May 5, 1976, Pat. No. 4,101,984. This application Nov. 20, 1979, Ser. No. 95,965
Claims priority, application Canada, May 9, 1975, 226993; United Kingdom, Dec. 22, 1975, 52474; Canada, Oct. 19, 1976, 43407
Int. Cl.³ A61F *1/24*
U.S. Cl. 3—1.4 **20 Claims**

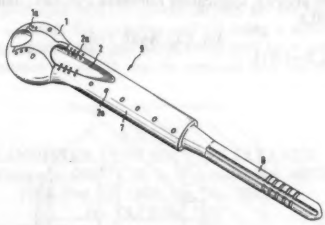
1. A small bore flexible vascular graft constructed of flexible biocompatible hydrophilic polymeric material and comprising an elongate tube having an inside diameter of from about 2 to about 6 mm and a strength at least sufficient to withstand venous blood pressure of greater than 25 mm Hg in the physiological environment for at least one year, said tube having an inner porous surface in fluid flow communication with a network of interconnected sphere-like pores in the adjacent subsurface which has a pore size of less than about 50 microns and a porosity of about 10 to about 70% by volume, said tube having an outer porous surface in fluid flow communication with a network of interconnected pores in the adjacent subsurface which has a pore size of less than about 200 microns and a porosity of about 10 to about 70% by volume.

4,355,427

ARTIFICIAL HUMERUS HEAD

Wolfgang Schneider, Weddigenufer 12, D-4900 Herford, Fed. Rep. of Germany

Filed Dec. 12, 1980, Ser. No. 215,979
Int. Cl.³ A61F *1/03*
U.S. Cl. 3—1.91 **7 Claims**



1. An artificial humerus head comprising an elongated unitary member having a pin at one end thereof for insertion into the shaft of a humerus, a substantially spherical head at the other end thereof, and a shaft between said pin and head adapted to act as a continuation of the humerus when said pin is inserted into the shaft of the humerus, said spherical head having an elongated groove formed in its exterior surface for

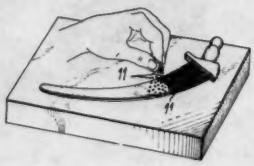
longitudinally receiving the long biceps tendon, said groove extending generally in the direction of elongation of said member between spaced points on the outer periphery of said head and being oriented at a slight angle to the longitudinal axis of said elongated member, and a cover member covering said groove and cooperating with said groove to form an open-ended, enclosed channel for the long biceps tendon extending through said head generally in the direction of elongation of said member.

4,355,428

SURGICAL PROSTHESIS WITH GRAINY SURFACE

Victor Deloison, Courbevoie, and Gilbert Pottier, Calvados, both of France, assignors to S.A. Benoist Girard & Cie, Val de Marne, France

Continuation of Ser. No. 810,772, Jun. 28, 1977, Pat. No. 4,819,984. This application Nov. 5, 1979, Ser. No. 91,165
Claims priority, application France, Jul. 2, 1976, 76 20297
Int. Cl.³ A61F 1/20
U.S. Cl. 3—1.91 4 Claims



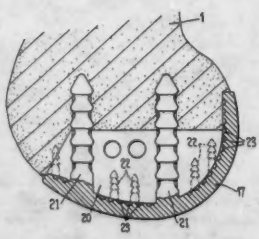
1. A bone prosthesis having a body portion and a grainy multiple planed surface portion comprising a multitude of projections which are approximately in the shape of spherules cast in one piece with the body of the prosthesis from which they project and to which they are directly joined, said projections having interstitial spaces between them with the interstitial space between two neighboring projections being non-uniform throughout the projection height and having at least a constriction at a point intermediate between the body of the prosthesis and the external free end of said projections and said space being not smallest at the base of the projections where attached to the body of the prosthesis.

4,355,429

SLIDE PROSTHESIS FOR THE KNEE JOINT

Heinz Mittelmeier, Blieskastel, Fed. Rep. of Germany; Heinz Moser, Selzach, and Beat Leu, Ipsach, both of Switzerland, assignors to Osteo AG, Selzach, Switzerland

Filed Jan. 23, 1980, Ser. No. 114,335
Claims priority, application European Pat. Off., Jan. 26, 1979, 79810010.3
Int. Cl.³ A61F 1/03
U.S. Cl. 3—1.911 9 Claims



1. A slide prosthesis for cementless attachment to a knee joint, comprising:

a joint member having a joint surface and an opposite mounting surface;

at least two primary securing pins extending from the mounting surface of said joint member to attach the prosthesis to the joints;

a plurality of secondary securing pins extending from the mounting surface of said joint member adjacent the periphery thereof to supplement the attachment of the prosthesis to the joint, said secondary securing pins being smaller than and parallel to said primary securing pins;

each of said primary and secondary securing pins having a ridged profiled with interstices for admission of bone growth so as to preclude unintentional dislodgement of the prosthesis from the knee joint; and

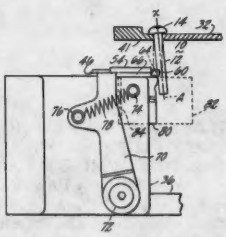
a support plate extending from the mounting surface of said joint member and connected to and extending between said primary securing pins.

4,355,430

POINTING MACHINE

Edwin J. Skierski, Campbellsville, Ky., assignor to USM Corporation, Farmington, Conn.

Continuation of Ser. No. 75,744, Sep. 14, 1979, abandoned. This application May 4, 1981, Ser. No. 260,304
Int. Cl.³ B23G 9/00
U.S. Cl. 10—9 11 Claims



1. A pinch pointing machine for pinch pointing a point on screw blanks, said machine comprising:

a pair of dies for pinch pointing, by a pinching operation, screw blanks therebetween;

means for supporting successive screw blanks between said pair of dies; and

alignment means for accurately securing both tangentially and radially each successive screw blank between said dies during the pinching of each of said blanks to permit their longitudinal axis to be properly aligned with said dies, whereupon said axis and the point on said screw blank are coaxial, said alignment means including a pivotable member with a screw blank locating portion thereon to help control the tangential and radial orientation of said screw blank between said dies.

4,355,431

BRIDGE ELEMENT

Wolfgang Diefendahl, and Karl-Friedrich Koch, both of Duisburg, Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed May 23, 1980, Ser. No. 152,622
Int. Cl.³ E01D 15/14
U.S. Cl. 14—27 8 Claims

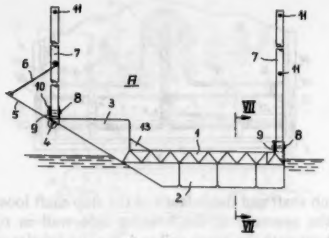
1. A floatable bridge element, having a roadway and being inclined at the lower edge along one longitudinal side, for bridging obstacles, especially bodies of water, said bridge element comprising in combination:

a substantially flat hollow compartment panel, the upper surface of which serves as said roadway;

a rigid buoyancy body extending below and rigidly con-

nected with the lower surface of said compartment panel, a portion of the underside of said buoyancy body being inclined; and

coupling means, connected to said compartment panel along the non-inclined longitudinal side of said bridge element as well as along both end faces, for interconnecting bridge elements along their non-inclined longitudinal sides as



well as along their end faces, said coupling means including at least one coupling section, which conforms to a coupling section of another bridge element and is adapted to latch same during interconnection of the pertaining bridge elements, said coupling means being arranged in such a way that at least during end face interconnection of two bridge elements, the latter are in alignment with each other.

4,355,432

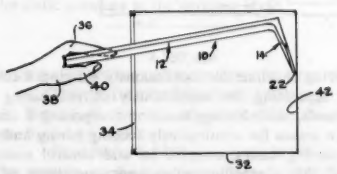
HAND TOOL FOR SCRAPING PAINT FROM PAINT CAN

James P. Storm, Jr., 329 Linfield Pl., Menlo Park, Calif. 94025

Filed Jun. 13, 1980, Ser. No. 159,251

Int. Cl.³ A47G *21/00*

U.S. Cl. 15—245 **6 Claims**



1. A hand tool for scraping paint from the bottom and curved sidewall of a paint can comprising: a handle member having a pair of opposed ends; and a blade member integral with one end of the handle member and extending laterally therefrom, the blade member being fan-shaped and having an outer periphery provided with a curvature substantially complemental to the curvature of the sidewall of the paint can, said blade member having a flat surface for engaging the bottom of the paint can, the flat surface of the blade member extending throughout substantially the entire area of the blade member, the members being flexible to permit them to yield as the flat surface engages and moves along the bottom of the paint can.

4,355,433

APPARATUS FOR CLEANING ROOT CROPS IN THE FIELD

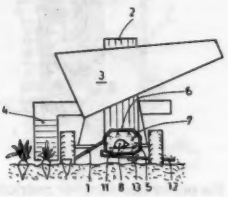
Martin Dietrich, Paternoster 5, Mertingen, Fed. Rep. of Germany

Filed Sep. 18, 1980, Ser. No. 188,363

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1979, 2938439

Int. Cl.³ B08B *3/02*

U.S. Cl. 15—302 **7 Claims**



1. An installation mounted on a harvester for cleaning root crops in the field by spraying jets of water on all sides of the root crop after its removal from the soil, comprising:

a cleaning unit mounted on the harvesting machine having a plurality of inwardly directed peripherally arranged jets for spraying a cleaning liquid on all sides of the root crops to clean them;

conveyor means passing through said cleaning unit and permeable to the spray from said jets, capable of transporting the root crops to be cleaned through the cleaning unit and depositing them after cleaning in a crop storage bunker;

means for supplying cleaning liquid to the jets of said cleaning unit under pressure;

means for collecting the cleaning liquid after it has been sprayed to clean the crops;

means for removing residues cleaned from the crops from the collected water;

means for recycling said residue-removed water to the jets; and

receiving device means for pre-soaking the root crops in cleaning liquid comprising:

a conveyor means for conveying the root crops from the ground to a pre-soaking reservoir containing cleaning liquid, and

a conveyor means for conveying the root crops through said pre-soaking reservoir, wherein the receiving device is embodied by a reservoir (23) having an opening for the introduction of the root crops and being located at a lower level than the cleaning unit (6) and in which passes the third conveyor belt (5) having carriers for the root crops to be cleaned, the cleaning unit (6) being a strainer (48) having nozzles (10) and being enveloped by a jacket (49) the interior of which can be emptied into the reservoir (23).

4,355,434

CANNISTER TYPE SUCTION CLEANER

Dean W. Gongwer, 66607 C.R. 1, Wakarusa, Ind. 46573

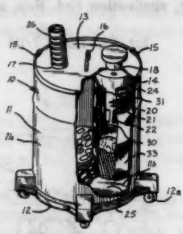
Filed Nov. 10, 1980, Ser. No. 205,685

Int. Cl.³ F23J *1/02*

U.S. Cl. 15—327 R **7 Claims**

1. In a suction cleaner of the type having an open top metal container, sidewalls and a bottom wall, a metal cover closing the open top of the container, a suction creating impeller disposed within the container, a housing enclosing the impeller and provided with an orifice, and an electric motor drivingly connected to the impeller, the container being provided with an air inlet opening and an air discharge opening, the improvement comprising, a perforated metal member adjacent to the

orifice in the housing enclosing the impeller, and a filtering member of fire resistant material interposed between the perforated member and the impeller, the space between the inner surface of the sidewalls and the perforated member being adapted to receive hot coals and ashes entering through the air



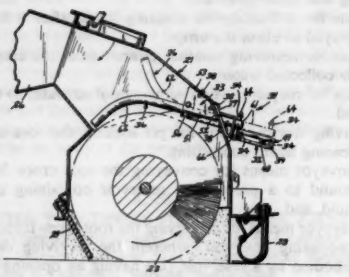
inlet opening, the perforated member restricting passage of the hot coals through the perforated member, the filtering member being pervious to air and preventing passage of ashes through the orifice of the housing enclosing the impeller and through the discharge opening.

4,355,435

SURFACE MAINTENANCE EQUIPMENT

Paul W. Kimzey, St. Louis Park, and Daniel J. Super, New Hope, both of Minn., assignors to Tennant Company, Minneapolis, Minn.

Filed Sep. 12, 1980, Ser. No. 186,704
Int. Cl.³ A47L 5/12
U.S. Cl. 15—347 **15 Claims**



1. Surface maintenance equipment comprising a body structure, a plurality of wheels for supporting said body structure, a downwardly opening housing defining a pickup chamber, said housing having a debris exit, said housing being carried by said body structure, means for storage of dirt and debris which are picked up from said chamber, duct means for interconnecting said housing and said storage means, a plurality of spaced, anti-clog bars overlying the exit of said housing whereby said anti-clog bars prevent oversized debris from entering and clogging said duct means.

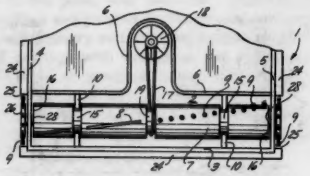
4,355,436

VACUUM CLEANERS

Samuel Hertzberg, 29 Country Club La., Pomona, N.Y. 10970

Filed Jan. 19, 1981, Ser. No. 226,396
Int. Cl.³ A47L 5/30
U.S. Cl. 15—383 **15 Claims**

1. In a vacuum cleaner characterized by a revolvable brush roll horizontally supported in the nozzle area within the side walls of a housing, the combination of a brush roll with a free end, an aperture in the side wall of the housing adjacent the said free end in axial alignment with it, a stub shaft, at least a portion of a disk brush incorporating at least a portion of the rim section and its circumference bristles and a portion of the hub section, and a bumper guard with a gap therein affixed to the aforesaid exterior side wall of the housing, the gap adjacent the aperture; the disk brush portion positioned within the gap in the bumper guard rigidly affixed at the hub section to an end



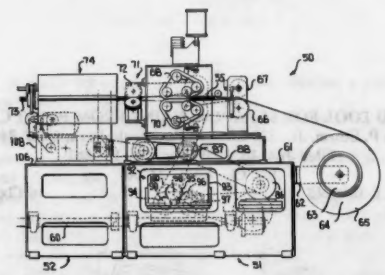
of the stub shaft and the balance of the stub shaft loosely penetrating the aperture in the housing side wall in rigid axial engagement with the brush roll end, the rim bristles capable of making contact with a floor surface, and the hard, unyielding parts of the disk brush portion confined within the aforesaid gap; the disk brush portion thereby revolvable with the brush roll and the room wall protected against abrasion as the bumper guard is run along a wall-floor edge.

4,355,437

QUICK CHANGE DRIVE FOR SHIRRING MACHINE CONTROL SHAFT

Norbert L. Wright, Park Ridge, and Wayne L. Hahn, Chicago, both of Ill., assignors to Teepak, Inc., Chicago, Ill.

Filed May 8, 1980, Ser. No. 147,771
Int. Cl.³ A22C 13/02
U.S. Cl. 17—42 **2 Claims**



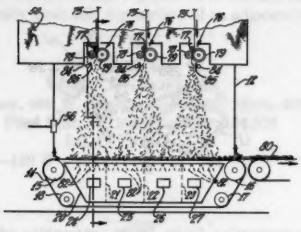
1. A shirring machine for continuously shirring a tubular casing and separating the continuously shirred casing into separate strands, said shirring machine comprising a control motor, drive means for continuously feeding casing and continuously shirring casing coupled to said control motor, a control shaft for controlling subsequent operations of said machine including casing separation, a quick change drive between said control motor and said control shaft for varying the rotational speed of said control shaft relative to the speed of continuous casing feed and shirring to change cycle time whereby the length of a separted shirred casing strand from a continuous shirred casing and subsequent operations may be varied, said quick change drive being of the type wherein there may be change in the rotational relationship between said drive means and said control shaft during a drive change, and timing means mounted on one end of said control shaft adjacent said quick change drive for assuring the proper rotational position of said control shaft relative to said drive means after a drive change.

4,355,438

MAT FORMING APPARATUS

James E. Reeves, Jr., Anderson, S.C.; Michael P. Dunn, Newark, and John L. Patterson, Granville, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Feb. 17, 1981, Ser. No. 235,263
Int. Cl.³ D04H *1/00*
U.S. Cl. 19—0.51 **10 Claims**



1. A mat forming apparatus comprising an air temperature and humidity control chamber, a supply-air plenum, a first fan having an inlet connected to the temperature and humidity control chamber and an outlet connected to the supply-air plenum, a chopper room connected to the supply-air plenum, strand choppers in the chopper room, a forming hood beneath the choppers for receiving chopped strands from the choppers, an endless conveyor chain beneath the forming hood for collecting the chopped strands, forming them into a mat, and transferring the mat away from the forming hood for further processing, a chopped strand collecting chamber for collecting chopped strands which happen to pass through the conveyor chain, a suction chamber disposed beneath an upper flight of the conveyor chain and having an inlet communicating with the forming hood through the conveyor chain and an outlet communicating with the chopped strand collecting chamber, nozzle-forming downstream convergent baffle plates in the inlet of the suction chamber, a second fan having an inlet connected to the chopped strand collecting chamber and an outlet connected to the temperature and humidity control chamber, each of said first and second fans having blades which are movable to change the pitch thereof, mechanism for moving the blades to change the pitch thereof, and an actuator for operating said mechanism, a static pressure sensor associated with the forming hood for sensing the static pressure therein, and a fan blade pitch controller operatively connected to the static pressure sensor and to the actuators of each of said fans for controlling the pitch of the fan blades in accordance with the static pressure in the forming hood.

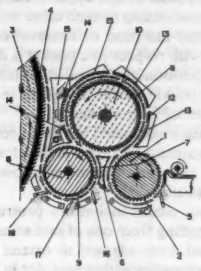
4,355,439

CLEANER-OPENER-COMBER DEVICE FOR TEXTILE FIBERS IN COMBING MACHINES

Juan B. Estebanell, Av. Dr. Fleming, 8-San Fructuoso Del Bages, Barcelona, Spain

Filed Mar. 7, 1980, Ser. No. 128,006
Claims priority, application Spain, Mar. 7, 1979, 241,864
Int. Cl.³ D01G *15/40*
U.S. Cl. 19—105 **5 Claims**

1. A cleaner-opener-comber device for cleaning, opening and combing a fibrous wet in a combing machine having a large drum means rotatable in a first direction, comprising first taker-in means mounted in said machine for rotation in a direction opposite to said first direction and having first pin means around the periphery thereof slanted in said opposite direction for taking in said fibrous web; second taker-in means mounted intermediate said first taker-in means and said large drum means in said machine for rotation in said opposite direction and having second pin means around the periphery thereof slanted in said opposite direction for taking in said fibrous web; separation means for isolating the fibrous web portion taken in by said first taker-in means from the fibrous web portion taken in by said second taker-in means; cylindrical drum means mounted proximate said first and second taker-in means for rotation in said first direction and for cooperation with said first and second taker-in means, said cylindrical drum means having third pin means disposed around the periphery thereof and slanted in said first direction; and plate means partially



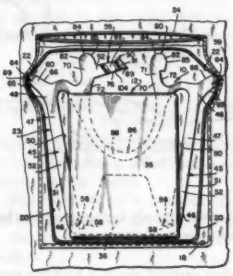
surrounding said cylindrical drum means and selectively adjustable with respect thereto, said plate means having fourth pin means slanted in a direction opposite to said third pin means, said fibrous web passing from said first taker-in means to intermediate said cylindrical drum means and said plate means and then to said second taker-in means for transporting said fibrous web to said large drum means.

4,355,440

WALLET THEFT GUARD

Francis J. Johansson, 135 Rhodes Dr., and Thomas Christenson, 7 Maple Dr., both of New Hyde Park, N.Y. 11040

Continuation-in-part of Ser. No. 51,106, Jun. 2, 1979, Pat. No. 4,241,476. This application Sep. 25, 1980, Ser. No. 190,623
Int. Cl.³ A45C *13/18*; A45F *5/02*
U.S. Cl. 24—3 H **13 Claims**



1. A wallet guard for use with a wallet and adapted to be used when placed in a pocket having a lower seam and a pair of side seams defining the width thereof to prevent removal therefrom, the wallet guard comprising:

A. a frame having a base with a pair of arms extending upwardly from said base, each said arm including a lower section integrally coupled to said base and an upper section terminating in a free end, said arms movable between an open position and a closed position, whereby in the open position the distance between said free ends is normally greater than the width of the pocket such that said arms will be biased inwardly by the side seams when inserted into the pocket with the base adjacent the lower seam to provide the upper portion of the pocket in tension,

B. engaging means including a gripping jaw formed at said free end of said upper section of each of said arms, each said gripping jaw having a distal end extending outwardly from said arm, such that said jaws engage the side seams of the pocket in the open position of the wallet guard to prevent removal therefrom, and said arms are narrower than the width of the pocket in the closed position thereof,

C. retaining means associated with said arms for removably securing said arms at said upper sections thereof in releasably fixed relationship to each other to maintain the closed position when insertion or removal of the wallet guard and wallet with respect to a pocket is desired, such that in the closed position of the wallet guard it may be inserted within the pocket of the user and in the open position removal thereof is prevented,

D. locking means associated with said retaining means so as to readily maintain said arms in the closed position thereof when said arms are compressed towards each other a defined distance,

E. said locking means includes a protrusion having a slot therein extending from one of said arms, and a neck on the other of said arms adapted to extend in frictional interlocking relationship within said slot in the closed position and readily separable for movement to its open position, and

F. guide means at one end of said protrusion for guiding said neck along said protrusion until said slot is reached and said neck is received therein for said interlocking relationship.

4,355,441

ROPE-LOCK

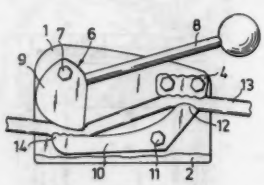
Gunnar B. Häll, Kornvägen 8, S-736 00 Kungsör, Sweden

Filed Nov. 16, 1979, Ser. No. 94,913

Claims priority, application Sweden, Nov. 24, 1978, 7812117; Feb. 15, 1979, 7901324; Feb. 15, 1979, 7901327; May 1, 1979, 7900113; May 1, 1979, 7900114

Int. Cl.³ F16G *11/04*

U.S. Cl. 24—134 KB **6 Claims**



1. A rope lock for selectively securing a rope having a tensile force applied thereto comprising:

an abutment;

a locking member pivotal about a locking member pin and having a thrust portion on a first end for clamping said rope against said abutment in a locking position, said locking member further having a contact portion on a second end thereof; and

an eccentric cam pivotal about a cam pivot pin and including an operating portion for selectively applying a latching force against said contact portion of said locking member;

the latching force selectively applied to said locking member by said operating portion of said eccentric cam producing a torque on said locking member to thereby clamp said rope between said abutment and said thrust portion of said locking member in said locking position;

said operating portion of said eccentric cam being selectively adapted, at least in said locking position, to operatively secure said rope between said operating portion and said contact portion.

4,355,442

CONNECTING DEVICE FOR AUTOMOBILE SEAT BELT

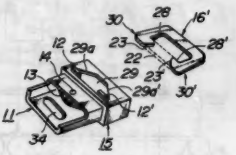
Yoshimi Sato, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 23, 1980, Ser. No. 199,849

Claims priority, application Japan, Oct. 31, 1979, 54-150798[U]

Int. Cl.³ A44B *11/25*

U.S. Cl. 24—230 AL **7 Claims**



1. In a connecting device for an automobile, which includes a buckle and a tang, said buckle comprising a base and a slider block slidably fitted with each other, said base comprising at least two latches urged away from each other by means of a spring and slidable in directions perpendicular to that of insertion of said tang, said spring being fixed at substantially the center of said base and integrally constructed with a spring forcing said tang out of said buckle when the former is released from the latter, said slider block provided with a guide hole engaging said latches of said base and having guides for moving said latches toward each other in response to a movement of said slider block, and said tang being made in the form of a C and having a pair of guides for moving said latches toward each other in response to an insertion of said tang into said buckle and a pair of anchoring portions adjoining said pair of guides for said latches.

4,355,443

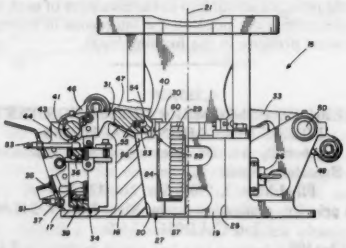
BOWL AND SLIPS ASSEMBLY WITH IMPROVED SLIP INSERTS

Henry W. Blackwell, Venus, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed May 9, 1980, Ser. No. 148,430

Int. Cl.³ F21B *19/06*

U.S. Cl. 24—263 D **11 Claims**



1. In a bowl and slips assembly having a plurality of tapered slip bodies with associated gripping inserts angularly spaced about the central axis of and mounted on a support bowl for movement between retracted and set positions with respect to a tapered opening in the bowl for the inserts to grip against the outside surface of tubing to support the latter upwardly in a well, the improvement in said assembly comprising a cantilever connection hang supporting each of said inserts from their respective slip bodies in a load bearing position so the reaction of forces through the assembly when supporting tubing places

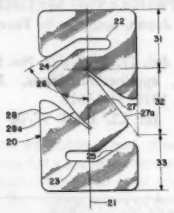
said slip bodies in compression, each of said connections including a top surface on said slip bodies and each of said inserts including an inner gripping surface and a lip projecting outwardly therefrom with said lips being in overlapping abutting engagement with said top surfaces of said slip bodies in said load bearing position, and with said inserts being substantially identical to each other and said inner gripping surfaces thereof being comprised of a plurality of vertically spaced, substantially parallel teeth, and said top surface of one slip body being offset vertically from said top surface of an adjacent slip body.

4,355,444

TIE CONNECTORS

Ivan L. Haney, 600 W. Orange, Greenville, Mich. 48838

Filed Mar. 28, 1980, Ser. No. 134,978
Int. Cl.³ F16G *11/04*
U.S. Cl. 24—129 B **2 Claims**



1. In combination with a flexible tension member, a connector plate having two longitudinally spaced apart connecting points establishing an axis of tension transmission, the improvement comprising:

one of said connecting points being formed by a laterally open, connecting point forming slot, in a side of said plate, at least the outer part of said slot being inclined to the axis of tension by an angle of less than ninety degrees, measured toward the other of said connecting points, said plate having a jam cleat forming, laterally open slot disposed in the side of the plate opposite to the side containing the connecting point forming slot, said jam cleat forming slot converging inwardly towards the axis of tension and being inclined relative to the axis of tension by an angle less than ninety degrees, measured toward the other of said connecting points, said jam cleat forming slot converging to a width less than the minimum transverse dimension of said tension member, whereby tension on said member tends to pull and jam said member into the converging inner portion of said jam cleat forming slot.

4,355,445

APPARATUS FOR PRODUCING INTERLACED MULTIFILAMENT YARNS

Tadayuki Matsumoto, Mishima; Kozo Imaeda, Shizuoka; Masatoshi Mineo, and Kiyoshi Nakagawa, both of Mishima, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 865,667, Dec. 29, 1977, abandoned, which is a division of Ser. No. 705,145, Jul. 14, 1976, Pat. No. 4,115,988. This application Dec. 14, 1979, Ser. No. 103,592
Claims priority, application Japan, Jul. 18, 1975, 50-87372
Int. Cl.³ D02J *1/08*
U.S. Cl. 28—274 **10 Claims**

1. An apparatus for producing an interlaced multifilament yarn comprising, in combination,

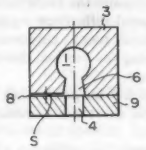
an interlacing nozzle having a hollow longitudinal space therein open at both ends thereof; at least one fluid conduit having an outlet for supplying a jetted fluid into said hollow longitudinal space;

members defining a yarn passage of a material yarn in said hollow longitudinal space;

said fluid conduit being fixed with respect to said members defining said yarn passage; said interlacing nozzle being provided with a rectifying and diffusing portion formed between said hollow longitudinal space and said outlet of said fluid supply conduit;

said rectifying and diffusing portion being provided with a fluid ejecting aperture having a maximum width opening into said hollow longitudinal space;

wherein the maximum width T of the rectifying and diffusing portion, at the point where the fluid conduit encounters the rectifying and diffusing portion, and measured along a direction perpendicular to the axis of said yarn passage, is less than 1.25 times of the maximum width t of the fluid ejecting aperture which is directly opened to the



yarn passage from said rectifying and diffusing portion, and measured along a direction perpendicular to the axis of said yarn passage, and also the axis of said fluid supply conduit is perpendicularly crossing the axis of said yarn passage, the height of said portion being h, with h being equal to 0.3 t to 20 t;

whereby said fluid coming from said fluid conduit is diffused in said rectifying and diffusing portion substantially in the direction of said axis of the yarn passage;

said nozzle having a thread-in slit for threading said yarn into said yarn passage; said slit extending from the point where said rectifying and diffusing portion meets said fluid conduit; and

said slit communicating with said portion;

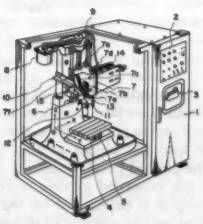
the minimum distance from the top edge of said slit in said diffusing portion to the point where said yarn passage encounters said diffusing portion being at least $0.2 \times h$.

4,355,446

AUTOMATIC TOOL CHANGER OF MACHINING CENTER

Tokiji Shimajiri, Kawasaki; Kenichi Toyoda, Hino, and Takahumi Yamazaki, Suita, all of Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan

Filed Oct. 4, 1979, Ser. No. 81,794
Claims priority, application Japan, Oct. 14, 1978, 53/126373
Int. Cl.³ B23B *39/20*; B23Q *3/157*
U.S. Cl. 29—26 A **7 Claims**



1. An automatic tool changer of a vertical machining center of the type having a spindle carrier adapted to be moved up and down by a rotary drive source for spindle carrier drive, a

turret capable of rotational and upward and downward movement provided on the spindle carrier, a member for interconnecting the spindle carrier and the turret for relative movement with respect to each other, a turret drive shaft connected at one end to the spindle carrier and at the other end to the turret, and a restraining member for blocking the upward movement of the turret so that tools are automatically changed through rotation of the turret caused by the relative movement between the turret and spindle carrier when the upward movement of the turret is blocked by the restraining member, comprising:

speed signal generating means for generating an analog signal representative of a command speed for the vertical drive motor;

tachometer generator means for generating an analog signal representative of the actual speed of the vertical drive motor;

mixing circuit means connected to both the speed signal generating means and the tachometer generator means for generating a speed difference signal;

speed control circuit means responsive to the speed difference signal for driving the vertical drive motor so as to reduce the difference to zero;

pulse generator means for generating a feedback pulse whenever the vertical drive motor rotates through a predetermined angle;

down-counter means for receiving a number corresponding to a predetermined movement of the spindle carrier, the content of the down-counter means being down counted every time the feedback pulse generator means generates a feedback pulse; and

a monitor means for monitoring the content of the down-counter means and generating a speed changeover signal when the content reaches a predetermined value,

wherein the speed signal generating means is responsive to the speed changeover signal and reduces the command speed of the vertical drive motor when the speed changeover signal is generated.

4,355,447

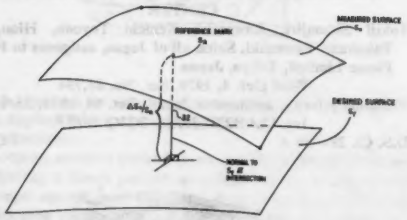
GAUGING SYSTEM FOR SCULPTURED SURFACES

Paul DiMatteo, Huntington; Robert Segnini, Stony Brook, and Paul Rademacher, Glen Head, all of N.Y., assignors to Solid Photography, Inc., Melville, N.Y.

Continuation-in-part of Ser. No. 157,435, Jun. 9, 1980, Pat. No. 4,337,566. This application Nov. 6, 1980, Ser. No. 204,693

Int. Cl.³ B23Q *35/02*

U.S. Cl. 29—26 A **10 Claims**



1. A method for removing material from an object to provide a desired finished surface having at least a portion with a substantially small radius of curvature, comprising the steps of: cutting grooves into the object so that the bottoms of the grooves lie on the desired finished surface, said grooves having a shape so that the observed groove width at the prevailing surface of the object is dependent on the groove depth and thereby dependent on the amount of material remaining to be removed between the prevailing surface and the desired finished surface; observing and measuring the prevailing surface; calculating depths of material to be removed in a sequence of material removing steps dependent on measurements of the prevailing surface and desired finished surface; controlling the depth of material removed from said calculated step during each of said material removing steps; and carrying out said material removing steps in sequence so that after the completion of the last step the surface exposed on the object coincides with the desired finished surface; said grooves being cut at least in said portion having a radius of curvature sufficiently small below a predetermined magnitude for defining said desired finished surface with a predetermined accuracy.

4,355,448

TRIM AND PRODUCING METHOD THEREOF

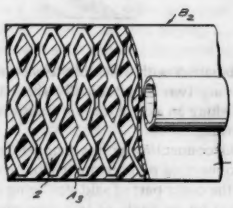
Sazo Ezaki, Bisai, Japan, assignor to Toyoda Gosei Co., Ltd., Nagoya, Japan

Filed Jul. 17, 1979, Ser. No. 58,385

Claims priority, application Japan, Jul. 17, 1978, 53-98073[U]; Apr. 30, 1979, 54-53618

Int. Cl.³ B23P *17/00*

U.S. Cl. 29—413 **3 Claims**



1. A method for producing a channel-shaped trim including a core member embedded within a covering material and having a longitudinally extending opening for embracing and clamping an edge flange of a support member comprising the steps of:

preparing a band-shaped metal network comprised of a deformable material by forming a plurality of connecting portions and a plurality of lozenge shaped spaces which are linearly disposed in rows in both the longitudinal and transverse directions of the trim, respectively, each space being disposed between adjacent connecting portions in both the longitudinal and transverse directions of the trim;

forming predetermined ones of the connecting portions as weakened portions which are easily broken by bending stresses applied in a direction perpendicular to the longitudinal direction of the network;

said weakened portions being comprised of all connecting portions which are disposed in every other transversely extending row;

covering the network with a covering material to form a covered network;

applying bending stress to the covered network in a direction perpendicular to the longitudinal direction thereof to break the weakened connection portions thereby separating the network at predetermined locations along the length thereof; and

bending the covered network in the transverse direction to form a longitudinally extending channel-shaped opening in the trim and in the core member composed of the separated network embedded within the covering material.

4,355,449

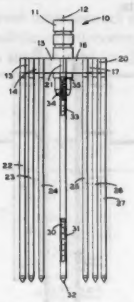
METHOD OF ASSEMBLING AND DISASSEMBLING A CONTROL COMPONENT STRUCTURE

Gerald T. Edwards, and Donald C. Schluderberg, both of Lynchburg, Va., assignors to The Babcock & Wilcox Company, New Orleans, La.

Division of Ser. No. 952,523, Oct. 18, 1978, Pat. No. 4,314,885. This application Jun. 1, 1981, Ser. No. 269,188

Int. Cl.[3] B23P *19/00*

U.S. Cl. 29—426.2 5 Claims



1. A method of assembling and disassembling a control component structure for a nuclear reactor comprising the steps of; providing a spider having at least one arm having a bore formed therein, a burnable poison rod having an end cap with a larger diameter than the bore's diameter, and a flanged stem, inserting the stem in an axial direction into the spider bore until further insertion is precluded by a retaining force which is provided by the flange resting against the spider

affixing the inserted end of the stem to the burnable poison rod,

applying a force to the rod and stem in the axial direction with respect to the spider bore with sufficient force to overcome the retaining force by breaking the flange, and

withdrawing the stem from the spider bore while maintaining structural unity of the poison rod and maintaining structural unity of the spider.

4,355,450

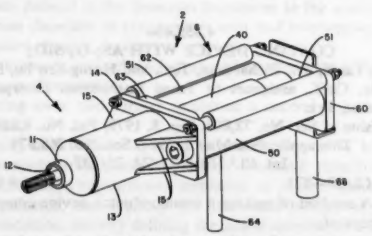
METHOD OF OPERATING A TUBE EXTRACTING MECHANISM

Charlie D. Miller, East Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Division of Ser. No. 18,549, Mar. 8, 1979, Pat. No. 4,283,826, and a continuation-in-part of Ser. No. 907,239, May 18, 1978, abandoned. This application Jun. 1, 1981, Ser. No. 268,933

Int. Cl.[3] B23P *19/00*

U.S. Cl. 29—426.5 3 Claims



1. A method of operating a tube extracting apparatus to extract a tube from a tube sheet, the tube extracting apparatus including a longitudinally extending stationary frame, a movable frame connected to the stationary frame and having a mid plate located rearward thereof, a sleeve supported for longitudinal movement within the stationary frame and connected to a front side of the mid plate for unitary longitudinal movement therewith, radially expandable jaw means also supported for longitudinal movement within the stationary frame, expansion means extending within the jaw means, and expansion power means supported by the movable frame, extending through the mid plate and having a surface abutting against a back side thereof, and connected to the expansion means, the method comprising the steps of:

extending the expansion power means to move the expansion means forward relative to the stationary frame and to expand radially the jaw means into engagement with the tube;

engaging the jaw means with the sleeve for unitary longitudinal movement therewith; and

moving the mid plate rearward relative to the stationary frame to move the sleeve, the jaw means, the expansion power means, and the expansion means rearward, and thereby to pull the tube from the tube sheet.

4,355,451

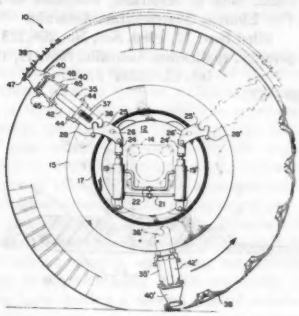
RETRACTABLE DEVICE AND METHOD FOR PROVIDING TRACTION

Marvin C. Thomas, Pinewood Springs, Lyons, Colo. 80504

Filed May 12, 1980, Ser. No. 148,874

Int. Cl.[3] B23P *19/02, 19/04;* B60C *27/20, 27/14*

U.S. Cl. 29—426.6 43 Claims



1. A traction apparatus for a vehicle wheel, comprising:

mounting means adapted to be fixedly supported adjacent a rotatable vehicle wheel;

an outer assembly rotatably carried by the mounting means at a journal positioned substantially concentric to the rotation of the vehicle wheel;

a pair of deployment arms mounted on the outer assembly for concentric movement around the center of rotation of the journal and extending radially from the outer assembly;

an expandable and retractable track supported by the traction apparatus substantially by suspension between the ends of the two deployment arms;

means positioned substantially internally of the rotatable outer assembly to selectively drive the deployment arms in opposite rotational directions from a retracted to a deployed position and back to the retracted position; and

means to radially extend and retract the deployment arms as a function of the position thereof relative to the rotatable outer assembly, whereby the track may be encircled around the wheel by driving the deployment arms in one direction, and secured to the wheel by moving the deployment arms radially inward at such position, or, alternatively, the track may be retracted and stored by moving the track away from the wheel by radially extending the

deployment arms and rotating the deployment arms to store the track in a retracted position.

25. A method of operating a traction device for a wheeled vehicle comprising:

mounting a fixed support adjacent a rotatable vehicle wheel,

rotating an outer assembly concentrically with the rotation of the vehicle wheel around a journal between the outer assembly and the mounting means;

extending a length of track to encircle the vehicle wheel by moving a pair of deployment arms in opposite rotational directions around circular paths substantially concentric to the rotation of the outer assembly, the arms being moved by spring means bearing thereon;

moving the deployment arms radially inward to engage the attached track to the rotating wheel upon substantial completion of the encirclement thereof by the track; and

retracting the length of track by first moving the deployment arms radially outward and then in opposite rotational directions to compress and position the track at a position radially spaced from the rotating wheel, the spring means being compressed by latching one of the deployment arms to the fixed support and causing the rotating wheel to at least partially retract the track and compress the spring means.

4,355,452

METHOD OF FORMING A MOUNTING FOR A TANK COVER

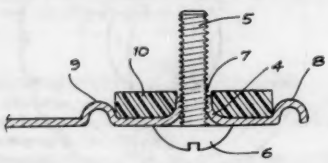
Raymond D. Massey, Cambridge Park, and Vincent Di Santo, Marrickville, both of Australia, assignors to Zip Heaters (Aust.) Pty. Limited, Marrickville, Australia

Filed Nov. 12, 1980, Ser. No. 206,223

Claims priority, application Australia, Nov. 19, 1979, PE1390

Int. Cl.³ B23P *11/00*

U.S. Cl. 29—437 **5 Claims**



1. A method of forming a mounting for an inspection cover or the like in a sheet metal tank, said method comprising the steps of forming the desired opening in the sheet metal wall of said tank, bursting a plurality of holes through said sheet metal around the periphery of said opening, inserting headed, threaded fasteners into said holes so that the headed portions thereof lie on the opposite side of said sheet metal from the burst portions of said holes supporting said headed portions of said fasteners, pressing said burst portions inwardly to engage the threaded portions of said fasteners and pressing a reinforcing flange in said sheet metal around the periphery of said openings.

4,355,453

METHOD OF PROTECTING THE SURFACES OF CONCRETE STRUCTURES

Hans Pause, Ratingen, and Walter Stiller, Essen, both of Fed. Rep. of Germany, assignors to Philipp Holzmann Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 14, 1980, Ser. No. 206,893

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1979, 2948255

Int. Cl.³ B23P *3/00, 19/04*

U.S. Cl. 29—460 **10 Claims**

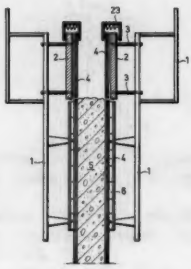
1. A method of constructing a poured concrete structure protected from corrosive agents comprising the steps of:

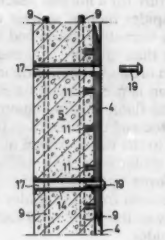
applying large surface sealing elements supported by a formwork and defining at least one surface having a component in an upright direction of said concrete structure before pouring said concrete;

overlapping perimeter areas of adjacent sealing elements to provide protection to the concrete from liquids flowing under gravity forces;

providing anchoring elements on said sealing elements extending into a region into which concrete for said structure is to be poured;

attaching climbing rails for a climbing formwork to said anchoring elements;





applying a sealing strip having a high modulus of elasticity and great resistance to corrosion in a region of said climbing rails;

pouring said concrete inside said sealing elements and said formwork; and

setting said concrete whereby said sealing elements become anchored to said structure by said anchoring elements in set concrete whereby said climbing formwork is movable on said rails to another higher position.

4,355,454

COATING DEVICE WITH AS_2-O_3-SIO_2

Al F. Tasch, Jr., Richardson, Tex., and Horng-Sen Fu, Sunnyvale, Calif., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 72,803, Sep. 5, 1979, Pat. No. 4,319,260.

This application May 5, 1981, Ser. No. 260,579

Int. Cl.³ H01L *21/22, 21/283*

U.S. Cl. 29—571 **4 Claims**

1. A method of making a semiconductor device comprising the steps of:

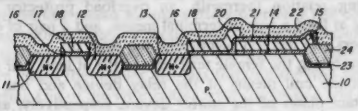
forming regions of another conductivity type in a substrate of one conductivity type;

forming an insulator layer on said substrate;

forming at least one layer of gates and gate interconnects on said insulating layer;

forming a multilevel interconnect system insulating layer of

arsenic doped glass on said layer of gates and gate interconnects; and



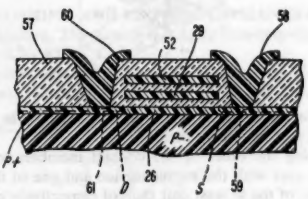
reflowing said multilevel interconnect system insulating layer by heating said multilevel interconnect system insulating layer sufficiently to smooth said insulating layer.

4,355,455

METHOD OF MANUFACTURE FOR SELF-ALIGNED FLOATING GATE MEMORY CELL

Charles E. Boettcher, Sandy, Utah, assignor to National Semiconductor Corporation, Santa Clara, Calif.

Division of Ser. No. 59,235, Jul. 19, 1979, Pat. No. 4,272,774.
This application Nov. 17, 1980, Ser. No. 207,653
Int. Cl.³ H01L *21/22*
U.S. Cl. 29—571 **4 Claims**



1. In a method of producing a floating gate memory cell on a substrate of one conductivity type, the steps comprising:

forming insulation over the substrate,

forming a conductor over said insulation,

forming a pattern over said conductor,

preferentially etching the conductor with the pattern as a mask to leave the conductor as a partially formed floating gate defined in the direction transverse to the source-to-drain direction as coextensive with and overlapping the future channel region,

forming over said cell including said floating gate a further layer of insulation,

forming over said further insulation a second conductive layer,

etching said further layer by a pattern as a mask in the source-to-drain direction and by the same pattern as a mask removing sufficient insulation to expose unmasked conductor, and etching the unmasked portion of said conductor, thereby defining the said conductor as a floating gate which is coextensive with and overlapping the future channel in the source-to-drain direction, and

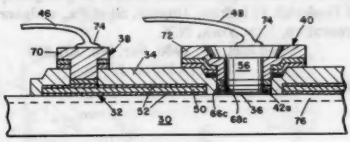
forming at one end of said channel region a source and at the opposite end of said channel region a drain, the source and drain surface regions being of opposite conductivity type from the substrate.

4,355,456

PROCESS OF FABRICATING A SCHOTTKY BARRIER PHOTOVOLTAIC DETECTOR

Gary L. Harnagel, La Verne; Gerry T. Laga, Placentia, both of Calif.; Joseph M. Harrison, San Dimas, all of Calif., and Victor A. Twaddell, Fairport, N.Y., assignors to General Dynamics, Pomona Division, Pomona, Calif.

Division of Ser. No. 128,325, Mar. 7, 1980, Pat. No. 4,319,258.
This application Jul. 8, 1981, Ser. No. 281,258
Int. Cl.³ H01L *31/18*
U.S. Cl. 29—572 **2 Claims**



1. A process of fabricating a Schottky barrier photovoltaic detector comprising the steps of:

slicing a wafer from a single crystalline cadmium sulfide ingot, the wafer having upper and lower substantially planar surfaces which are substantially perpendicular to the c-axis of the hexagonal crystal of the cadmium sulfide, the upper surface being the cadmium-rich side of the wafer;

lapping, polishing and etching the upper surface of the wafer to produce a substrate having a smooth upper surface and a lower surface;

depositing and delineating an infrared shield structure on the upper surface of the substrate, the shield structure having a first central window therein, including the steps of depositing a layer of titanium which is approximately 50 angstroms to approximately 5,000 angstroms thick, then a layer of gold which is approximately 500 angstroms to approximately 10,000 angstroms thick, followed by another layer of titanium which is approximately 50 angstroms to approximately 5,000 angstroms thick;

depositing and delineating an insulating layer which covers the infrared shield structure, the insulating layer being made of silicon dioxide and being approximately 500 angstroms to approximately 20,000 angstroms thick, the insulating layer having a second central window and a side window therein, the second central window being coincident with and slightly smaller than the first central window;

depositing and delineating a Schottky barrier metallization layer within the second central window so that it completely covers the portion of the upper surface of the substrate which is located therein, the Schottky barrier metallization layer being made of platinum and being approximately 5 angstroms to approximately 50 angstroms thick;

depositing and delineating a boundary layer which overlies the Schottky barrier metallization layer, the boundary layer being made of gold and being approximately 100 angstroms to approximately 300 angstroms thick;

depositing a contact adhesion layer made of titanium which is approximately 50 angstroms to approximately 5,000 angstroms thick, the contact adhesion layer covering the insulating layer;

depositing a contact metallization layer made of gold which is approximately 1,000 angstroms to approximately 2,000 angstroms thick, the contact metallization layer covering the contact adhesion layer;

electroplating barrier and ohmic contact pads made of gold within the second central window and the side central window so that the contact pads extend above the insulating layer;

etching away portions of the contact metallization layer, contact adhesion layer, and boundary layer to isolate the

contact pads from each other and expose a major portion of the platinum Schottky barrier metallization layer located within the second central window; and

bonding the ends of a pair of gold lead wires to respective ones of the barrier and ohmic contact pads.

4,355,457

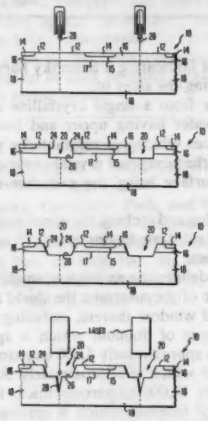
METHOD OF FORMING A MESA IN A SEMICONDUCTOR DEVICE WITH SUBSEQUENT SEPARATION INTO INDIVIDUAL DEVICES

Salvadore P. Barlett, Hazleton; Daniel J. Dougherty, Exeter, and Frederick P. Lokuta, Dupont, all of Pa., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 29, 1980, Ser. No. 201,826

Int. Cl.³ H01L *21/78*

U.S. Cl. 29—583 **6 Claims**



1. A method of forming a mesa in a semiconductor device, said method comprising:

forming a plurality of semiconductor devices each having at least one PN junction on a wafer;

mechanically cutting a first set of relatively wide generally U-shaped channels extending in a first direction on opposite sides of each of said devices and cutting a second set of relatively wide generally U-shaped channels extending in a second direction generally perpendicular to the first direction on opposite other sides of each of said devices, said channels having a bottom generally planar surface located below said PN junction and a pair of generally planar mesa walls at which said junctions terminate;

etching said channels for a short time in a dilute etchant to smooth the channel surfaces and to provide a slight arcuate contour to each said mesa wall; and,

separating said devices from each other by breaking the wafer along the midline of said channels.

4,355,458

METHOD OF MAKING AN ELECTRICAL CONTROL

Lee O. Woods, Morrison, and Donald L. Haag, Sterling, both of Ill., assignors to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 940,589, Sep. 8, 1978, Pat. No. 4,237,508.

This application Jun. 5, 1980, Ser. No. 156,845

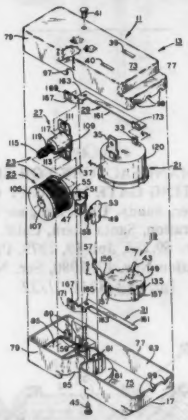
Int. Cl.³ H01F *41/00*

U.S. Cl. 29—602 R **8 Claims**

1. A method of making an electrical control having a pair of housing parts with at least a pair of openings in one of the housing parts and at least another opening in the other of the housing parts, and the electrical control also having a plurality of electrical components including at least a pair of female terminals, a solid state starter device having a PTCR interposed between a pair of contact plates, a relay device having coil means with an armature member adapted for magnetic coupling relation therewith, an overload protector device having at least a pair of terminal means, and a pair of contact members, the method comprising the steps of:

(a) connecting the female terminals of the at least pair thereof with the coil means of the relay device and one of the contact plates of the starter device, respectively, and also connecting the contact members with the other of the contact plates of the starter device and with the coil means of the relay device and one terminal means of the at least pair thereof on the overload protector device, respectively;

(b) mounting one of the contact members to the other housing part with the coil means of the relay device and the overload protector device connected to the one contact member and extending the other of the terminal means of the overload



protector device through the another opening in the other housing part exteriorly thereof;

(c) mounting the other of the contact members to the one housing part with the starter device and one of the female terminals of the at least pair thereof respectively connected to the other contact member and inserting the one female terminal into one of the openings of the at least pair thereof in the one housing part;

(d) inserting the other female terminal of the at least pair thereof into the other of the openings of the at least pair thereof in the one housing part; and

(e) assembling the one housing part and the other of the housing parts together so that the overload protector device and the starter device are positioned adjacent each other and so that the contact members are positioned for contacting engagement with the armature means in the coil means of the relay device.

4,355,459

METHOD OF COILING A WIRE IN A TUBE

Teruo Takahashi, 7-42, 1-chome, Shimoizumi-cho, Niihama-shi, Ehime-ken, and Rintaro Ito, 8-11, 2-chome, Nakamura, Niihama-shi, Ehime-ken, both of Japan

Filed Mar. 10, 1980, Ser. No. 128,651

Claims priority, application Japan, Mar. 10, 1979, 54/028047

Int. Cl.³ H01F *41/06*

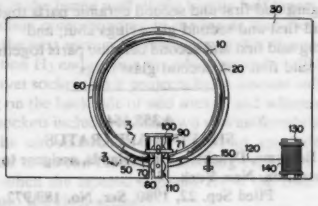
U.S. Cl. 29—605 **7 Claims**

1. Method of coiling a wire comprising:

positioning a hollow tubular member in a frame in such manner that the tubular member is held in a fixed position and a first gap is formed between first and second ends of the tubular member;

inserting a leading end of wire into the tubular member through the first end;

continuously feeding the wire into the tubular member by wire feeding means having a friction driving roll cooperating with a vibratory friction roll so that the leading end of the wire advances through the tubular member and wire enters the tubular member through the first gap, the leading end of the wire exiting from the second end of the tubular member and entering again the first end whereby



continuous feeding of the wire forms a coil within the tubular member;

removing the tubular member and coil from the frame;

sliding a sleeve over an end of the tubular member prior to positioning the tubular member in the frame; and

sliding the sleeve with respect to the tubular member after formation of the coil so that the sleeve is moved into a covering position covering a portion of the coil located in the first gap.

4,355,460

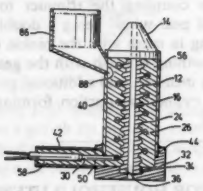
SPRUE BUSHING AND METHOD OF MANUFACTURE

Jobst U. Gellert, 233 Armstrong Ave., Georgetown, Ontario, Canada (L7G 4X5)

Continuation-in-part of Ser. No. 217,115, Dec. 17, 1980, abandoned. This application Feb. 17, 1981, Ser. No. 234,641

Int. Cl.³ H05B *3/00*

U.S. Cl. 29—611 **11 Claims**



1. A method of manufacturing an integral electrically heated sprue bushing having a hollow elongated inner core portion defining a central runner passage extending between an enlarged front portion and an enlarged back collar portion, a helical heating element encircling the inner core portion, a highly conductive elongated portion around the heating element, and an elongated outer sleeve portion over the conductive portion, comprising the steps of:

(a) manually assembling the heating element onto the core portion to extend between the front and back portions;

(b) securing an outer sleeve in a position to enclose a space around the heating element between the front and back portions to form an assembly with the space being sufficiently sealed to prevent substantial leakage;

(c) vacuum filling the space with a highly conductive molten material to provide the intermediate portion; and

(d) allowing the highly conductive material to cool sufficiently to solidify.

4,355,461

APPARATUS FOR HOLDING SLIDERS ON AN ANGULARLY MOVABLE INDEXING MEANS

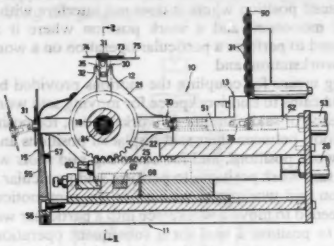
Hisashi Doori, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Japan

Filed Sep. 4, 1980, Ser. No. 184,028

Claims priority, application Japan, Sep. 7, 1979, 54-115388

Int. Cl.³ B23P *19/04*

U.S. Cl. 29—768 **12 Claims**



1. An apparatus for holding sliders for application to pairs of slide fastener stringers, comprising:

(a) a frame;

(b) an indexing plate having a plurality of angularly spaced supports each for carrying one slider and rotatably mounted on said frame, and means for intermittently indexing said plate to advance sliders carried on the respective support through at least three successive, angularly spaced positions, each of said slider supports having a slot receptive of the pull tab of the slider and a spring-biased ball normally urged toward said slot to partly enter therein;

(c) means for supplying sliders one at a time to said slider supports at a first position by inserting pull tabs of said sliders in said slots;

(d) a spring-biased presser mounted on said frame for normally urging into pressing engagement with said spring-biased ball of one of said slider supports at a succeeding second position for coaction therewith to lock the slider on said support, whereby a pair of slide fastener stringers can be threaded through the slider as locked; and

(e) means for successively removing the sliders from said supports at a succeeding third position.

4,355,462

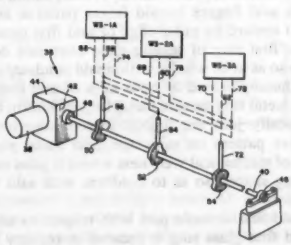
PROCESS MACHINE HAVING A SINGLE CAM ACTUATOR PER CATEGORY OF PROCESSING FUNCTION

Rogers B. Downey, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 4, 1980, Ser. No. 137,435

Int. Cl.³ B23P *19/00*

U.S. Cl. 29—791 **11 Claims**



1. Apparatus for performing a series of operations on a

workpiece at a plurality of spaced-apart workstations, comprising:

energizable drive means;

cam means having a plurality of rotatably mounted cams remote from at least one of said workstations, each of said cams being coupled to said drive means to provide a plurality of specific cam-shape related motions to each of said workstations when rotated by said drive means;

a plurality of movably mounted tools with at least one tool at each of said workstations, each tool movable between a displaced position where it does not interfere with workpiece movement and a work position where it can be actuated to perform a particular operation on a workpiece at a workstation; and

coupling means for coupling the motions provided by each of said cams to said workpiece for moving said workpiece into each of said plurality of workstations, for positioning said tools between their said displaced positions and their said work positions, and for actuating said tools when in their said work positions to perform said particular operation on said workpiece, with all of the cam motions that are needed to move a workpiece into a particular workstation, to position a tool for a subsequent operation on a workpiece at said particular workstation and to actuate a tool to perform said subsequent operation on a workpiece being provided by said cams to each of said workstations within a single cam means rotational cycle.

4,355,463

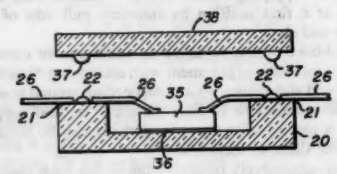
PROCESS FOR HERMETICALLY ENCAPSULATING SEMICONDUCTOR DEVICES

Carmen D. Burns, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Mar. 24, 1980, Ser. No. 133,053

Int. Cl.³ H01R *43/02*

U.S. Cl. 29—827 **10 Claims**



1. A tape assembly process for hermetically encapsulating semiconductive devices secured to a tape having a plurality of fingers defining a plurality of metal finger patterns, one pattern each for each semiconductive device, said finger patterns including an inner end arrayed to conform with the contact pads of the semiconductive device which is secured thereto, said process comprising the steps:

applying a series of conductive patterns around the periphery of a first ceramic part that is to become a portion of a housing for said semiconductive device, said conductive patterns being arrayed so that individual conductors register with said fingers in said finger patterns and radiate outward toward an outer edge of said first ceramic part;

applying a first ring of sealing glass over said conductive patterns so as to lie wholly within said conductive patterns which thereby extend on both sides of said first ring;

forming a metal ring on said metal finger pattern, thereby to mechanically join the fingers thereof together in each successive pattern on said tape, said metal ring having regions of mechanical weakness where it joins each finger and being shaped so as to conform with said first glass ring;

aligning said first ceramic part with respect to said tape so that said first glass ring is located in registry with said metal ring;

bonding said fingers in said patterns to said conductive patterns to secure adherence thereto, on both sides of said glass ring, whereby said metal ring lies over said glass ring;

removing said metal ring by stripping so as to break said regions of mechanical weakness, thereby exposing said first glass ring;

forming a second ceramic part that mates with said first ceramic part;

applying a second ring of sealing glass to the periphery of said second ceramic part to conform to said glass ring on said first ceramic part;

bringing said first and second ceramic parts together so that said first and second glass rings abut; and

sealing said first and second ceramic parts together by means of said first and second glass rings.

4,355,464

SHAVING APPARATUS

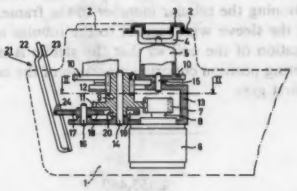
Wijtse Bergsma, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 22, 1980, Ser. No. 189,972

Claims priority, application Netherlands, Oct. 18, 1979, 7907681

Int. Cl.³ B26B *19/00*

U.S. Cl. 30—34.1 **1 Claim**



1. A shaving apparatus which comprises a drivable shaving member; an electric motor having a motor shaft; a gear-wheel transmission coupling the shaving member to the electric motor, said gear-wheel transmission including a pinion mounted on the motor shaft, a gear-wheel connected to the shaving member, and an additional gear-wheel; a trimmer; and an eccentric mechanism coupling the trimmer to the electric motor; the additional gear-wheel being a double gear-wheel having a first toothing in mesh with the pinion on the motor shaft and a second toothing in mesh with the gear-wheel connected to the shaving member, said additional gear-wheel also having an eccentric cylindrical portion forming part of the eccentric mechanism.

4,355,465

HANDLES FOR HOUSEHOLD UTENSILS

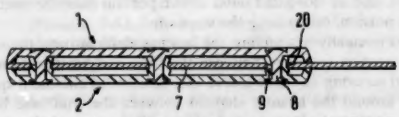
Gilbert Besson, Grenoble, France, assignor to A. Raymond, Lorrach, Fed. Rep. of Germany

Filed Sep. 26, 1980, Ser. No. 191,020

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1979, 2939306

Int. Cl.³ B25G *3/00*

U.S. Cl. 30—344 **3 Claims**



1. In a handle made of plastic for an apertured support blade of a household utensil comprising: (a) two handle havles resting on both sides of the support blade and terminating flush with the blade rim, and (b) rivet elements to join the handle

halves after the support blade has been inserted between them, the improvement wherein the rivet elements comprise at least two projecting rivet sockets formed as one piece with one of the handle halves and the same number of corresponding rivet pins formed as one piece with the other handle half, the outside diameter of the rivet sockets being such that they pass through the apertures of the support blade when the rivet pins are introduced into the rivet sockets, and wherein each rivet pin consists of three segments H_1, H_2 and H_3 of which the segment H_1 beginning at the inside wall of the handle half tapers down to a cross section corresponding to the inside diameter of the rivet socket, the next section H_2 remaining at this diameter and the third section H_3 ending in a tip which extends sufficiently beyond the rivet socket that it projects by an amount sufficient for clinching on the back side of said socket, and wherein each of said rivet sockets includes at least two slits uniformly distributed along its circumference and extending approximately from its center to its end face for facilitating expansion of the rivet socket when the tapered segment H_1 of the rivet pin is introduced into the rivet socket.

4,355,466

PUNCHING TOOL HAVING REPLACEABLE TIPS

Michael S. Quiring, 3100 Yukon Ave., North, Crystal, Minn. 55427

Filed Feb. 20, 1981, Ser. No. 236,142
Int. Cl.³ B26F *1/32*
U.S. Cl. 30—358 **8 Claims**

1. A punching tool adapted for accepting a plurality of punch tips, and a punch tip therefor, comprising:

(a) a punch body having a first end adapted for hammering, and having a second end formed into a decreasing conical taper;

(b) a threaded section on said punch body immediately adjacent said second end taper, and a nut threadably fastened only on said punch body for removing said tip by engagement of a facing surface of said nut with an end face of said punch tip; and

(c) said punch tip having a conical recess therein, the depth of said recess being greater than the length of said punch body taper.

4,355,467

METHOD AND APPARATUS FOR CHECKING PARTS OF A CONSTANT VELOCITY JOINT

Gastone Albertazzi, Bologna, Italy, assignor to Finike Italiana Marposs S.p.A., S.Marino di Bentivoglio, Italy

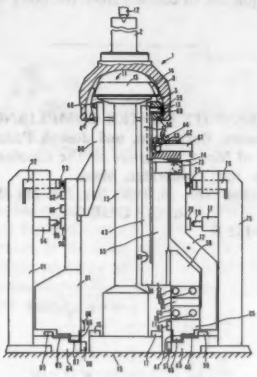
Filed Nov. 24, 1980, Ser. No. 209,975
Claims priority, application Italy, Dec. 3, 1979, 3558 A/79
Int. Cl.³ G01B *7/28*
U.S. Cl. 33—143 L **11 Claims**

8. Apparatus for checking a member of a constant velocity joint, the member defining a geometrical axis and ball races angularly spaced with respect to the geometrical axis, comprising:

a first support means for supporting the member;

a gauging means including a plurality of gauging heads for providing measurement signals representative of dimensions of the ball races in an equatorial plane of the ball races, said measurement signals depending on the positions of the centers of the races in said equatorial plane;

second support means coupled to the first support means for supporting the gauging means; and



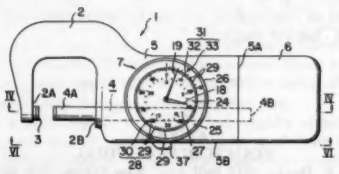
processing means connected to the gauging heads for processing the measurement signals for defining said centers of the ball races and for determining the center of a circumference approximating the centers of the ball races, whereby this center provides a reference point for the member checking, said processing means being adapted to provide second signals representative of the distances of the centers of the ball races from said reference point and to provide a third signal representative of the mislocation of the ball races as the difference between the maximum and minimum values of said second signals.

4,355,468

MICROMETER

Ichiro Mizuno, and Masao Nakahara, both of Kawasaki, Japan, assignors to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Mar. 29, 1981, Ser. No. 247,273
Claims priority, application Japan, Mar. 31, 1980, 55-42992[U]; May 14, 1980, 55-66051[U]
Int. Cl.³ G01B *5/02*
U.S. Cl. 33—147 F **6 Claims**



1. A micrometer comprising a letter 'U' shaped frame, an anvil fixed on one end of said frame and directed to the other end thereof and a spindle supported on said frame in a manner to be axially movable from the other end to one end and, during measuring, the forward end thereof comes into abutting contact with an article being measured, characterized in that said micrometer further comprises; a body integral with the

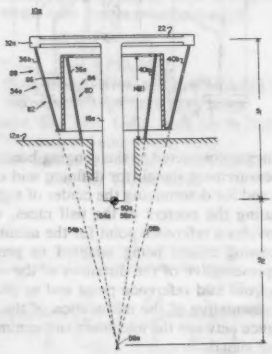
frame; an arm connected to said spindle and projected outwardly from the body; a rack formed on said spindle in the axial direction thereof; a dial indicator driven by the spindle through pinions being meshed with said rack when the spindle moves in the axial direction thereof; and a control knob tiltably connected to the outer end of said arm and biased in one direction of tilting by means of a spring, whereby said control knob is pressed at one end thereof against the body side in the normal condition and, when said control knob is pressed at the other end against a biasing force of the spring, said control knob is brought out of contact from the body side.

4,355,469

FOLDED REMOTE CENTER COMPLIANCE DEVICE

James L. Nevins, Burlington, and Joseph Padavano, Shrewsbury, both of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Nov. 28, 1980, Ser. No. 211,357
Int. Cl.³ G01B 5/25
U.S. Cl. 33—185 R **9 Claims**



1. A folded remote center compliance device including first and second structures serially connected between a mounting member and an operator member for enabling translational motion and rotational motion of said operator member about a remote center at, near or beyond the end of said operator member; one of said structures including at least two stages connected in series, each stage including flexure means disposed along radii from a focus, a first of said stages being connected with the other of said structures and a second of said stages being connected with one of said members, the other of said members being connected with the other of said structures, and an intermediate section for interconnecting flexure means in adjacent stages.

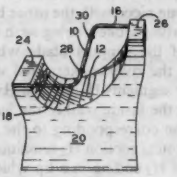
4,355,470

EQUATORIAL SUNDIAL

Timothy E. Doyle, 1010 Bell Ave., New Haven, Ind. 46774

Filed Jan. 12, 1981, Ser. No. 224,432
Int. Cl.³ G01C 17/34
U.S. Cl. 33—270 **14 Claims**

1. A sundial comprising a dial surface and an elongated, rod-like gnomon fixedly secured in operative relation thereto, said surface having an upward curvature outwardly from the central portion as developed from a flat plane about a given axis, said gnomon paralleling said axis, said surface between its ends extending transversely of said gnomon at an obtuse angle therewith, whereby the opposite end portions of said surface



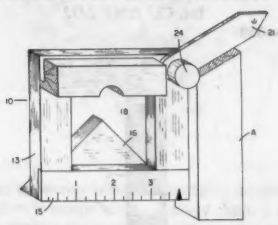
are offset in a direction parallel to said axis, and spaced time lines on said surface parallel to said axis.

4,355,471

SQUAREANGLE

L. Allan Cross, Groveville, N.J., assignor to Richard M. McMahon, Baltimore, Md.

Filed Oct. 8, 1980, Ser. No. 195,244
Int. Cl.³ B43L 13/00
U.S. Cl. 33—422 **13 Claims**



1. An integral, mobile combination drafting and carpentry device comprising:

a rigid square body bounded by four sides and having a front and back surface and having a square opening through said surfaces located precisely at the center of the said body;

a rigid triangle having forty-five degree angles at its base with the length of the triangle base being the same as one side of said body and secured to the back surface of said body with the triangle base parallel to and coextensive with the edge of said one side of said body;

a measuring scale on the front surface of said body and located near said one side and including a levelness reference mark located near another side which intersects said one side;

a rigid movable blade having a pointed end and being rotatably attached to said body front surface at the junction of said other side with a side that is parallel to said one side and said pointed end cooperating with said reference point;

a means of firmly holding said blade at any angle through its rotation.

4,355,472

DRAFTING AID

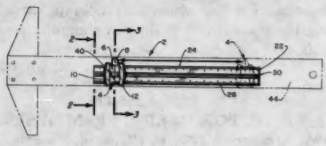
Richard Wedge, 11927 Venice Blvd., #4, Los Angeles, Calif. 90066

Filed Aug. 25, 1980, Ser. No. 180,646
Int. Cl.³ B43L 7/00
U.S. Cl. 33—486 **9 Claims**

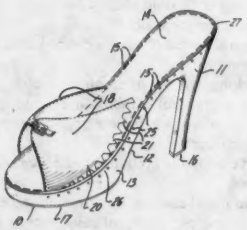
1. A drafting aid comprising the combination of:

a linear member having spaced, lateral, bead-like protuberances extending the length thereof, an integral member

having an inside surface configuration defining spaced channels to receive said bead-like protuberances on said linear member for slidable movement in cooperation with said linear member and having a protuberance generally defining a normal reference relative to said linear member, and having cooperative means for fixed securement with said linear member, said cooperative means being normally disposed in the fixed securement position and releasable for linear movement of said integral member along the extent of said linear member, said cooperative means comprising upstanding ears having depending abutment stops that engage said linear member in high friction manner between said bead-like protuberances and wherein said cooperative means are flexible to disengage said abutment stops for sliding movement along the extent of said linear member.



4,355,473
MOLDED SHOE
Zelik M. Ilitzky, Enrique Rodo 2986, Providencia, Guadalajara, Mexico
Filed Sep. 29, 1980, Ser. No. 191,674
Int. Cl.³ A43B *3/12, 23/00*
U.S. Cl. 36—11.5 **6 Claims**



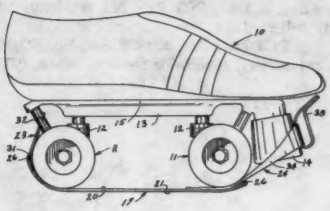
1. A shoe comprising a molded lower portion having a platform, shank and heel, a plurality of slots in the top surface of said platform extending downwardly and adjacent the periphery thereof, an upper having depending sides, a plurality of sections extending downwardly from the edges of said depending sides, said sections adapted to be placed within said slots and means for securing said sections in said slots, wherein said slots are substantially V-shaped slots extending downwardly from said platform and having elongated openings extending along said periphery and said sections are substantially V-shaped.

4,355,474
ROLLER SKATE SOLE
Gary Grim, 1391 Poplar, Clarkston, Wash. 99403
Filed Jan. 12, 1981, Ser. No. 224,059
Int. Cl.³ A43B *5/00;* **A63C** *3/00*
U.S. Cl. 36—132 **16 Claims**

1. A movable flexible sole for releasable attachment to a roller skate having longitudinally spaced front and rear pairs of wheels at the respective front and rear ends of the skate to cover the wheels and hold them immobile and to allow relatively normal walking by one wearing the roller skate, said sole comprising:

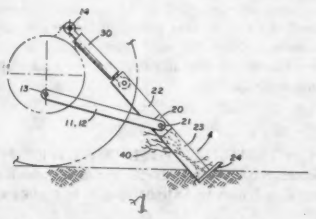
an elongated sheet of flexible material having opposed ends and first and second opposed outer surfaces extending between said ends;

said sheet having a transverse width dimension greater than transverse spacing between paired wheels of the roller skate;



first and second releasable mounting means at the respective sheet ends for selectively attaching the sheet to the front and rear ends of the skate with the sheet taut and the first sheet surface engaging all wheels to hold them immobile and with the second sheet surface exposed outwardly as a supportive walking surface.

4,355,475
ROOT GRUBBING PLOW
Travis O. Harkness, Rte. 1, Box 95-A, Kaufman, Tex. 75142
Filed Oct. 28, 1980, Ser. No. 201,543
Int. Cl.³ A01B *13/00;* **A01G** *23/06*
U.S. Cl. 37—2 R **5 Claims**



1. A grubbing plow for extraction of vegetation from soil said plow being mounted to a vehicle by a 3-point hitch having two lower arms and an upper attachment point, said grubbing plow including means enabling the extraction of vegetation from the soil while said vehicle is maintained stationary comprising:

(a) a frame having a horizontal pivot bar journaled at opposite ends thereof on said lower arms and having an upper member and a lower member, said pivot bar being pivotally mounted for rotational movement about a horizontal axis, said upper and lower members being aligned and oppositely directed from said pivot bar;

(b) a knife-edged, V-shaped blade rigidly attached to the lower end of said lower member and lying in a plane perpendicular to the length of said lower member; and

(c) a double acting hydraulic cylinder connected between said upper attachment point and the upper end of said upper member for forcibly swinging said blade in an arc around the axis of said pivot bar, said double acting hydraulic cylinder moving said blade between a first position within the soil for engaging the vegetation to be grubbed through said arc to a second position for lifting and removing the vegetation from the soil, such that the vegeta-

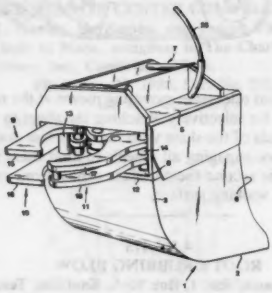
tion is extracted from the soil by operation of said hydraulic cylinder swinging said blade through said arc while the vehicle is maintained stationary.

4,355,476

BUCKET ASSEMBLY

Lars G. Engkvist, Kilafors, Sweden, assignor to Soneruds Maskin Aktiebolag, Hudiksvall, Sweden

PCT No. PCT/SE80/00001, § 371 Date Sep. 3, 1980, § 102(e) Date Sep. 3, 1980, PCT Pub. No. WO80/01393, PCT Pub. Date Jul. 10, 1980
PCT Filed Jan. 3, 1980, Ser. No. 202,441
Claims priority, application Sweden, Jan. 3, 1979, 79000040
Int. Cl.³ E02F 3/76
U.S. Cl. 37—117.5 9 Claims



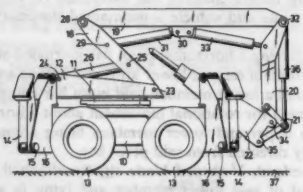
1. A bucket assembly for excavators or loaders, comprising:
a bucket having walls defining a volume, and an opening coplanar with one of said walls; and
a gripping tool adapted to be movable between two positions, the first of said positions being entirely within said volume defined by said walls, and the second of said positions extending partially out of said volume through said opening.

4,355,477

WORKING MACHINE WITH IMPROVED JIB SECTION

Lars Holmgren, and Per-Martin Holmgren, both of Skelleftea, Sweden, assignors to Aktiebolaget P. E. Holmgren, Skelleftea, Sweden

Filed Mar. 20, 1981, Ser. No. 246,066
Claims priority, application Sweden, Mar. 24, 1980, 8002258
Int. Cl.³ E02F 3/76
U.S. Cl. 37—117.5 6 Claims



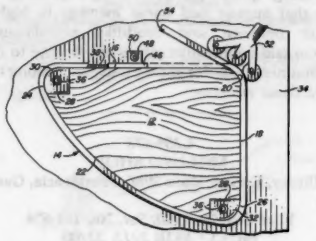
1. A working machine for such work as demolishing and excavating operations, comprising a chassis; an upper part arranged on said chassis for rotation about a substantially vertical axis; an arm arrangement carried by said upper part and consisting of a first, short jib section pivotally connected at one end thereof directly to said upper part, and a second, longer jib section pivotally connected at one end thereof to the free end of said first jib section; an intermediate arm pivotally connected at one end to the free end of said second jib section and carrying at the other end thereof a tool fitting; a first pressure cylinder device operative between said upper part and said first jib section; a second pressure cylinder device operative between said second jib section and said intermediate arm; a further pressure cylinder device operative between said first and said second jib sections; and means for controlling said first and said further pressure cylinder devices such that a given one of said devices can only be driven together with the other, whereat the arrangement of said first and said further cylinder devices is such that when they operate simultaneously they swing the jib sections at the same angular speed in opposite directions.

4,355,478

METHOD FOR MAKING FRAMED STRUCTURES

Joe W. Armstrong, 1229 E. Highland, Phoenix, Ariz. 85014

Filed Jun. 19, 1980, Ser. No. 160,977
Int. Cl.³ E06B 3/26; B23B 3/26; E06B 7/16; B32B 3/26
U.S. Cl. 40—154 9 Claims



1. A method for making a rigid irregularly shaped metal frame and attaching a flexible sheet of material thereto, said method comprising the steps of:
(a) forming a planar pattern with a desired irregular peripheral configuration;
(b) sizing an elongated metal channel so that its length is equal to the peripheral dimension of said pattern, said metal channel having a groove extending along one of its longitudinal surfaces;
(c) heating said channel at predetermined locations along the length thereof;
(d) pressing said metal channel into demountable conformity with the irregular periphery of said pattern to bring the opposite ends of said channel into abutting engagement with each other and to form the groove of said metal channel into an endless groove which faces outwardly of said pattern:
(e) interconnecting the opposite ends of said metal channel to form a rigid endless metal frame of irregular configuration:
(f) removing said rigid endless metal frame from its position of conforming with the periphery of said pattern;
(g) placing a sheet of flexible material on a holding fixture which is provided with means for demountably gripping the edges of said sheet so that it is held in a stretched planar attitude:
(h) supporting said holding fixture on a support surface so that said sheet is in spaced parallel relationship with said supporting surface;
(i) placing said rigid endless metal frame in juxtaposed bearing engagement with one of the planar surfaces of said sheet of flexible material held in said holding fixture;
(j) exerting a force on said endless metal frame to holdingly deflect said sheet into contiguous engagement with said support surface to draw said sheet taut;
(k) releasing the edges of said sheet from said holding fixture;

(l) inserting the edges of said flexible sheet of material in the endless groove of said rigid endless metal frame; and

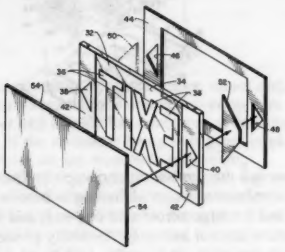
(m) wedging an elongated spline into the endless groove of said rigid metal frame atop the edges of said flexible sheet of material, said spline having means which form an interference fit with the endless groove of said rigid metal frame upon insertion therein.

4,355,479

SIGN CONSTRUCTION HAVING SELECTIVELY DISPLAYABLE DIRECTIONAL SIGNALS AND IMPROVED MOUNTING BRACKET

Arthur G. Thornton, 1312 Merona Pl., Anaheim, Calif. 92805

Filed Aug. 18, 1980, Ser. No. 179,046
Int. Cl.³ G09F *13/04, 7/00*
U.S. Cl. 40—570 **4 Claims**



1. In a sign construction of the type having a box-like frame with a bordering flange defining a front face opening and a message plate enclosed by said frame displaying a message unit discernible forwardly through said frame front face opening; the improvements comprising: opaque opposite side border strips between said message plate and said frame bordering flange, said border strips extending oppositely inwardly along and forwardly of said message unit positioned therebetween, a directional signal opening formed through each of said border strips inwardly of said frame bordering flange; said message plate displaying contrasting coloration relative to said border strips through said directional signal openings of said border strips so as to be normally discernible forwardly through said directional signal openings; each of said directional signal openings of said border strips being formed in the pattern of a directional signal; selectively slideably removable cover strips overlying said message plate and underlying said border strips covering said directional signal openings of said border strips and of the same coloration as said border strips, said cover strips being selectively removable by sliding along said message plate from beneath said border strips without appreciably disturbing assembly of said message plate and border strips; whereby, when said cover strips are in assembly covering said border strips directional signal openings, said same coloration as said border strips prevents discernment of said directional signal openings, and when said cover strips are slideably removed, said message plate contrasting coloration display permits ready discernment of said directional signal openings.

4,355,480

REEL MOUNTING HANDLE

Yasomatsu Morishita, Kure, Japan, assignor to Ryobi, Ltd., Hiroshima, Japan

Continuation of Ser. No. 10,444, Feb. 8, 1979, abandoned. This application Jul. 9, 1980, Ser. No. 167,079
Claims priority, application Japan, Feb. 8, 1978, 53-15493
Int. Cl.³ A01K *87/06*
U.S. Cl. 43—22 **4 Claims**

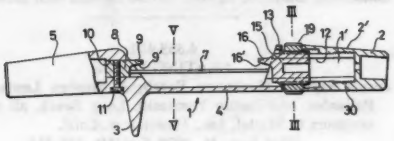
1. In a reel mounting handle including a gripper at its rear portion, a reel mounting portion at its intermediate portion, and a rod holder at its front portion, said reel mounting portion being formed with groove to mount a reel foot thereon, the improvement comprising:

(a) a stationary member disposed at a front end of the gripper to secure one end of the reel foot, said stationary member having a hook at its front end,

(b) a movable member slidably disposed in a front portion of the reel mounting portion to secure the other end of the reel foot,

(c) a guide member positioned at the front portion of the reel mounting portion, and adapted to enclosed guide the movable member for sliding movement, and

(d) a sleeve rotatably disposed in the front portion, the movable member being of cruciform shape in cross section and having major and minor generally rectangular projections



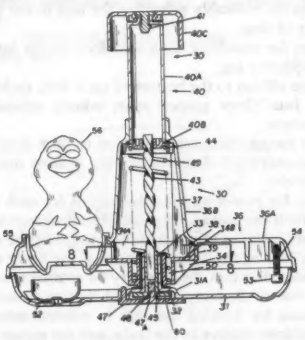
and a reel foot holder formed integrally therewith, the major projections extending outwardly of the guide member to engage the sleeve, the minor projections being guided within the guide member and preventing relative rotation between the movable member and the guide member, the guide member being formed substantially along the entire length of said front portion with a bore having a cruciform shape complementary to that of the movable member, said bore being open rearwardly toward the reel mounting portion for removal and insertion of the movable member therethrough, the upper and lower portions of the bore being opened along the length thereof such that the major projections extend outwardly of the openings.

4,355,481

MECHANICAL CAROUSEL TOP

John Joslyn, Bayview Ave., Sag Harbor, Long Island, N.Y. 11963

Filed Jan. 12, 1981, Ser. No. 224,393
Int. Cl.³ A63H *1/06*
U.S. Cl. 46—68 **7 Claims**



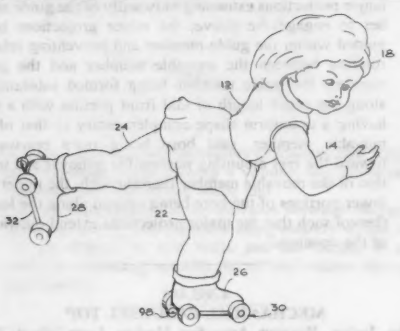
1. A carousel top comprising a base member for supporting said top on a supporting surface, an upper frame member connected to said base member, said upper frame member having opposed leg portions extending upwardly from said base member and a cross member interconnected between said leg portions, a turn table rotatably mounted on said base mem-

ber, a clutch housing connected to said turn table, said turn table being spaced above said base member, audio sounding means connected to the leg portion of said upper frame member adjacent to the periphery of said turn table, a clutch member disposed in said housing, a driver in the form of a twist bar extending through said clutch member, said driver extending above said cross member and disposed in alignment with said clutch member, a spring means for normally biasing said driver toward an inoperative position, said twist bar being longitudinally displaceable relative to said clutch whereby it effects engagement of said clutch in one direction of displacement to effect the drive of said turn table, and to disengage said clutch when displaced in the opposite direction to render said turn table free wheeling, a striker mounted on said turn table to strike said audio sounding means as said table rotates, and detachable animated figures carried on said turn table.

4,355,482
SKATING DOLL

Jurgis Sapkus, Manhattan Beach; J. Stephen Lewis, Pacific Palisades, and Toshio Yamasaki, Long Beach, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Nov. 26, 1980, Ser. No. 210,454
Int. Cl.³ A63H *11/00, 30/04*
U.S. Cl. 46—106 **2 Claims**

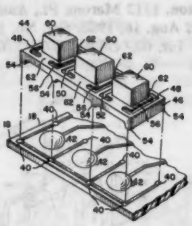


1. A skating doll comprising in combination:
a body including a head and a pair of arms;
a pair of legs;
means for pivotably attaching the legs to the body;
a pair of feet;
means for attaching each said foot to the lower end of a respective leg;
a skate affixed to the bottom of each foot, each skate having at least three spaced apart wheels rotatably mounted thereon;
drive means operatively coupled to each skate and located adjacent each skate for driving at least one of the skate wheels;
means for powering the drive means for each skate, and
in which the means for pivotably attaching the legs to the body includes means rotatably coupling the upper ends of the legs to the lower portion of the body about an axis oriented so that the legs may be rotated toward the front or rear of the body, and which further includes leg detent means for locking the legs in predetermined rotational positions relative to the body, and the means for attaching the feet to the legs includes means rotatably coupling the upper end of at least one said foot to the lower end of the adjoining leg about an axis parallel to the skating surface and oriented so that the one foot may be rotated thereabout toward the left or right of the body, and which further includes foot detent means for locking the one foot in predetermined rotational positions relative to the adjoining leg, whereby rotating the legs and the one foot of the skating doll to the predetermined positions allows the doll to balance on the one foot.

4,355,483
SWITCH MECHANISM

Donald G. Korzelius, Darien, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Jan. 5, 1981, Ser. No. 222,583
Int. Cl.³ A63H *33/26;* H01H *3/12*
U.S. Cl. 46—232 **11 Claims**

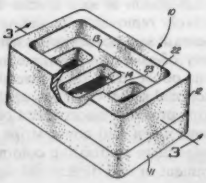


1. A switch mechanism comprising a body of resilient, electrically conductive material having a base with an opening therein and a bridge across said opening, said bridge having a push button portion and webs flexurally connecting said push button portion to said base for reciprocal movement when pushed, a wall having an aperture therein, a member having a plurality of fixed electrical contacts thereon, said body being disposed between said wall and said member with said push button projecting through said aperture, means for positioning said base and push button in alignment with said member and with different ones of said plurality of contacts to make a connection there between when said button is pressed and to break said connection when said button is released.

4,355,484
HYDROPONIC TRAY AND METHOD OF MANUFACTURE

Theodore O. Mandish, Rte. 2, Box 184, Titusville, Fla. 32780

Filed Sep. 8, 1981, Ser. No. 299,806
Int. Cl.³ A01G *31/02*
U.S. Cl. 47—58 **14 Claims**

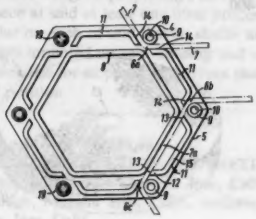


1. A method of making a floating hydroponic apparatus having a tray with a floating base portion and a tray portion comprising the steps of:
mixing foamed polymer beads and cement;
mixing the foamed polymer beads and cement with water;
molding a hydroponic tray having a floating base portion and a tray portion and a screen attached between the base portion and tray portion and having the tray portion open through to the base portion;
dipping said tray portion in an acidic solution; and
coating at least a portion of said tray with an alkaline resistant coating.

4,355,485
STACKING CONTAINERS

Peter A. Frank, 46/47 Frith St., London W1, England

Filed Aug. 15, 1980, Ser. No. 178,477
Claims priority, application United Kingdom, Aug. 15, 1979, 7928478
Int. Cl.³ A01G 9/02
U.S. Cl. 47—82 5 Claims



1. A stackable container having an open upper end, an underside with projections thereon adapted to cooperate with an edge of the upper end of a similar container, at least the upper and lower ends of the container being polygonal in plan view and said projections on the underside comprising:

(a) an essentially polygonal projection having the same number of sides as the polygonal lower end of the container, the sides of said projection being parallel to respective sides of the container and spaced inwardly therefrom;

(b) a plurality of corner projections between respective bottom corners of the container and adjacent corners of said polygonal projection, said corner projections having drain holes formed therethrough with removable plugging means and

(c) further projections at positions between the polygonal projection and the bottom edges of the container and spaced from said corner projections, said further projections being spaced from said polygonal projection by at least the thickness of the upper edges of the container and said further projections and said corner projections defining between them channels corresponding in shape to the corners of the upper edge of the container, whereby a plurality of such containers can be stacked one above the other in a horizontally staggered corner-to-corner or edge-to-edge formation with each upper container having at least one said drain hole opening into a lower one when its respective plugging means is removed.

4,355,486
SLIDABLE DOOR ASSEMBLY

Edward F. Sherwood, Gettysburg, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 23, 1980, Ser. No. 171,587
Int. Cl.³ E05D 13/02
U.S. Cl. 49—409 3 Claims

1. An arrangement for limiting the forces applied to spaced hanger rollers and spaced up-thrust rollers associated with a slidable door assembly, which provide the normal support and normal up-thrust protection, respectively, for the door assembly, comprising:

a structure defining a door opening,

a hanger plate having a pair of spaced hanger rollers and a pair of spaced up-thrust rollers mounted thereon,

a support assembly for said hanger plate disposed above said door opening,

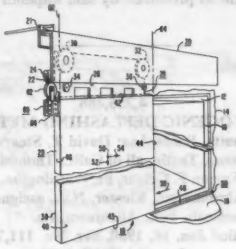
said support assembly including a hanger roller track on which the hanger rollers of said hanger plate travel, and a horizontally oriented guide surface for cooperating with said up-thrust rollers,

a door panel having top, bottom, and first and second side edges,

means fixing said door panel to said hanger plate such that predetermined movement of said hanger plate relative to said support assembly causes said door panel to move between open and closed positions relative to the door opening, with the first and second side edges of the door panel being leading and trailing edges, respectively, as said door panel moves from its open to its closed position, and

door stabilizer means fixed to said door panel, adjacent to its trailing edge,

said door stabilizer means including a stabilizer roller whose rotational axis is: (a) spaced from the trailing edge of the

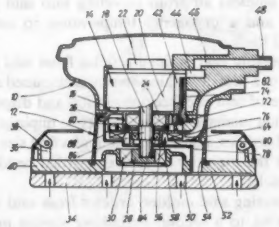


door panel, (b) outside the vertical projection of the door panel, (c) outside the spacing between the pair of spaced hanger rollers, and (d) outside the spacing between the pair of spaced upthrust rollers, said stabilizer roller cooperating with the horizontally oriented guide surface of said support assembly when a predetermined force is applied to the leading edge of said door panel, with said roller contacting said guide surface, at least during the application of the predetermined force, to limit the forces applied to said up-thrust and hanger rollers and prevent said hanger rollers from being displaced from the hanger roller track.

4,355,487
AIR-POWERED SANDER

Peter Maier, Gerokstrasse 1, 7311 Neidlingen/Teck, and Dieter Tschacher, Hohenzollernstrasse 4, 7313 Reichenbach, both of Fed. Rep. of Germany

Filed Jan. 28, 1981, Ser. No. 229,035
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1980, 3003805
Int. Cl.³ B24B 55/06, 23/00
U.S. Cl. 51—170 MT 11 Claims



1. In an air-powered sander with a housing, with a compressed air motor within said housing, with a pad movingly joined to said housing and designed to be moved by said motor for sanding a workpiece, and with a dust clearing system for dust produced on working with said sander, the improvement comprising wherein said sander further has an impellor wheel

freely turningly bearinged in said housing and having first and second groups of blades thereon, a structure of said housing enclosing an input airway to said motor, a further structure of said housing forming an air nozzle joined with said input airway and designed for producing an air jet blowing against said first group of blades, a further structure of said housing forming a dust take-up airway extending from a position near said pad to a position near radially inner ends of said second group of blades on said wheel, and forming a dust output airway extending from radially outer ends of said second group blades to a point at which said dust may be forced out of said housing in an air current as produced by said impellor wheel.

4,355,488

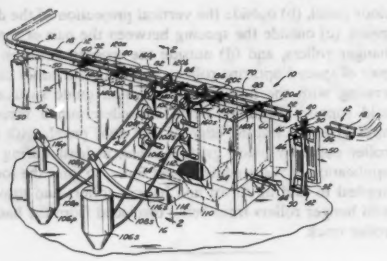
CRYOGENIC DEFLASHING METHOD

Robert E. Schmitz, Santa Ana; David T. Stearns, Turtle Rock; Erwin Stegmann, Tustin, all of Calif.; Thomas E. McWhorter, Whitehall; Warren F. Geiger, Ft. Washington, both of Pa., and Thomas J. Abrahamsen, Kloster, N.J., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jan. 14, 1980, Ser. No. 111,783

Int. Cl.³ B24B *1/00*

U.S. Cl. 51—319 **1 Claim**



1. A method of optimizing the continuous cryogenic removal of residual flash from molded articles comprising the sequential steps of:

(1) transporting said molded articles into an isolated entry station in a housing to serve as a buffer region to prevent interaction between the ambient air and a cryogenic environment;

(2) transporting said molded articles from said entry station into a pre-freezing station in said housing maintained at a pressure higher than ambient atmospheric pressure to hinder ambient air from traveling into said pre-freezing station and a cryogenic temperature to embrittle said residual flash;

(3) transporting said molded articles from said pre-freezing station to a first deflashing station maintained at the higher pressure of said pre-freezing station and dispersing a first deflashing media at a high velocity to impinge against said molded articles, said media being of a first size sufficient to remove the majority of said embrittled residual flash on said article;

(4) transporting said molded articles from said first deflashing station to a second deflashing station maintained at said higher pressure and dispersing a second deflashing media at a high velocity to impinge against said molded articles, said media being of a second size smaller than said first size to remove the remaining embrittled residual flash on said articles; and

(5) transporting said deflashed articles from the second deflashing station to an exit station isolated from the cryogenic environment and the ambient atmosphere.

4,355,489

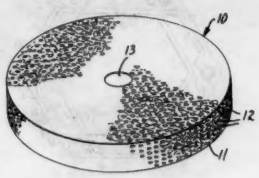
ABRASIVE ARTICLE COMPRISING ABRASIVE AGGLOMERATES SUPPORTED IN A FIBROUS MATRIX

Raymond F. Heyer, and William R. Lovness, both of Saint Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Sep. 15, 1980, Ser. No. 186,470

Int. Cl.³ B24D *11/00*

U.S. Cl. 51—400 **13 Claims**



1. An abrasive article comprising:

a matrix comprising undulated filaments bonded at points of mutual contact; and

a plurality of separated abrasive agglomerates at least 2 mm in average particle size distributed within said matrix, said abrasive agglomerates comprising abrasive particles bonded together with a bonding agent to provide an abrasive particle to bonding agent weight ratio of about 1:1–20:1.

4,355,490

MULTISTATION BLAST PROCESSING APPARATUS

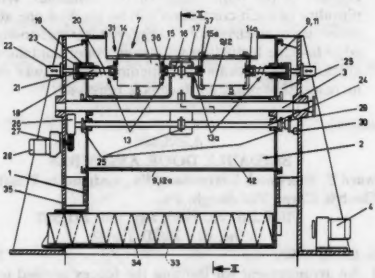
Henri G. Lepere, Schaffhausen, and Wolfgang Walter, Hallau, both of Switzerland, assignors to Georg Fischer Aktiengesellschaft, Switzerland

Filed Jun. 24, 1980, Ser. No. 162,573

Claims priority, application Switzerland, Jun. 29, 1979, 6090/79

Int. Cl.³ B24C *3/18, 9/00*

U.S. Cl. 51—419 **9 Claims**



1. A multistation blast processing apparatus comprising

a blast housing having a generally cylindrical shape, a generally horizontal axis and an open side located at the upper part of said housing;

workpiece conveying means rotatable about said generally horizontal axis for supporting a plurality of workpieces, said conveying means including

a plurality of walls for separating the interior of said housing into at least two chambers, said chambers being rotatable to be sequentially positionable at a loading and unloading station at said open side of said housing and to at least one blast processing station within said housing,

a driven shaft operatively associated with each said cham-

ber, said shaft being translatable as said chambers are rotated, and

holding means at each of said chambers for clamping at least one workpiece therein, each of said holding means being rotatable to rotate said at least one workpiece about an axis generally parallel with the axis of rotation of said conveying means;

means on said housing for propelling a blasting agent toward a workpiece at said at least one blast processing station;

a control disc on each of said driven shafts; and

control means mounted on said housing and engageable by said control disc for stopping said driven shafts in a predetermined position.

4,355,491

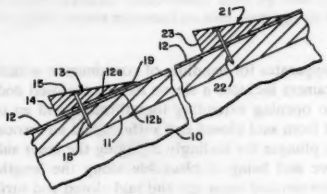
ROOF CONSTRUCTION AND METHOD

Otis M. Martin, 5624 Bodie Ct., San Jose, Calif. 95123, and John K. Kough, Morgan Hill, Calif., assignors to Otis M. Martin, San Jose, Calif.

Filed Aug. 18, 1980, Ser. No. 178,727

Int. Cl.³ E04D *1/36, 3/362*

U.S. Cl. 52—540 **15 Claims**



1. In a roof construction applicable to an inclined roof structure, strips of roofing composition applied to the structure in courses extending generally horizontally along the structure with the lower edge margin of each strip being disposed in overlapping contact with the upper edge margin of the next lower strip, and elongate members providing shadow line forming surfaces extending in spaced parallel relation along the structure, each of said members being applied over one of the joints formed by the overlapping edge portions of the composition strips and over the lower edge of the uppermost strip at the joint.

4,355,492

APPARATUS FOR AUTOMATICALLY BOXING CYLINDRICAL GOODS

Angel E. Torrenteras, Avenue du Roi Albert, 176, and Antonio E. Torrenteras, Kruipweg, 66, both of Brussels, Belgium

Filed Mar. 14, 1980, Ser. No. 130,333

Claims priority, application Belgium, Mar. 16, 1979, 0/194069; Nov. 5, 1979, 0/197970

Int. Cl.³ B65B *5/10, 57/20*

U.S. Cl. 53—58 **29 Claims**

1. Apparatus for automatically boxing cylindrical goods, particularly a plurality of uniformly-dimensioned cylindrical rolls of coins fed by at least one machine producing such cylindrical goods, which apparatus comprises:

means to longitudinally align a plurality of individuals of said goods and to move them in said aligned condition in parallel with said axis;

means to change the movement direction of said goods and to align a plurality of them by gravity with the longitudinal axes thereof in parallel relationship and to move said goods at a right angle to said axes;

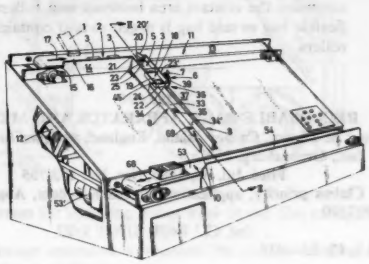
means to arrange one-by-one a plurality of empty prefabricated boxes on the goods path as said goods move by gravity at a right angle to the axes thereof;

means to immobilize, temporarily, each said box during the filling thereof;

means controlled by a counting mechanism driven by the passage of said goods, and so arranged as to release by gravity each respective, resultingly filled box and to operate said arranging and temporarily immobilizing means to replace the respective resultingly filled box by an empty box;

means to discharge the filled box;

said means for aligning the goods along the axis thereof and for moving same in aligned condition in parallel relation-



ship therewith being comprised of an endless belt driven with a continuous motion, on the top side of which individuals of the goods from said machine are dumped one at a time, the lengthwise axis of said belt side lying in a horizontal plane and the belt side making an angle therewith, and a guide extending in parallel relationship with said lengthwise axis of the belt side adjacent the belt side edge lying underneath said horizontal plane, said guide projecting over a distance at least equal to the radius of said individuals of said goods, relative to the belt side and extending on either side of that location where the goods are dumped.

4,355,493

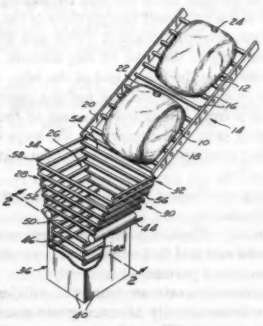
ROLLER CHUTE

Roger H. Ellert, San Clemente, Calif., assignor to Scholle Corporation, Irvine, Calif.

Filed Jun. 17, 1980, Ser. No. 160,556

Int. Cl.³ B65B *39/00, 5/04*

U.S. Cl. 53—113 **2 Claims**



1. A roller chute for packaging a flexible bag filled with liquid in a container having an open top and sidewalls, comprising:

four stacks of rotatably supported, vertically spaced rollers, each of said stacks forming one of four sides of said chute, and each of said stacks having an upper portion and a

lower portion, said lower portion stacks being oriented vertically;

said upper portion stacks extending upward above respective lower portion stacks, at least one opposing pair of said upper portion stacks inclined relative to the corresponding pair of said lower portion stacks to form a funnel-like opening for guiding said flexible containers into the opening formed by said lower portion stacks, said inclined pair of upper portion stacks forming a junction with the corresponding pair of said lower portion stacks; and

a pair of power driven rollers for urging said flexible bag into said container, said rollers located at said junction to maximize the contact area between said rollers and said flexible bag as said bag is urged to said container by said rollers.

4,355,494

RECLOSABLE BAGS, APPARATUS AND METHOD

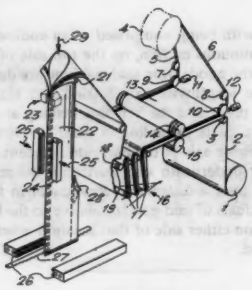
Paul A. Tilman, Canvey Island, England, assignor to Minigrip, Inc., Orangeburg, N.Y.

Filed Jul. 30, 1980, Ser. No. 173,755

Claims priority, application United Kingdom, Aug. 6, 1979, 7927390

Int. Cl.³ B65B *61/00, 9/12*

U.S. Cl. 53—416 **19 Claims**



1. A method including the steps of making and shaping a permanent assembly of bag making plastic sheet and separable and reclosable fastener strip into vertical upwardly opening tubular form adapted for gravitationally receiving bag filling contents in vertical form/fill/seal packaging; and the successive steps of sealing lower end portions of the vertical tube into bag sections, effecting cyclical dwell and intermittent downward advancing of the tube by bag sections and severing the bag sections from the lower end of the tube; the improvement consisting in supplying the bag making assembly to said tube forming step from a location adjacent to the location of said tube forming step, and comprising the steps of:

providing continuous length bag sheet material from a supply means;

providing continuous length separable fastener strip from a supply means;

continuously effecting joinder and securement of said sheet material and said fastener strip as derived from said supply means into a permanent assembly;

at a location downstream from said joinder and securement step uninterruptedly advancing said assembly toward said shaping step, while said successive steps of tube sealing, severing and cyclical dwell and intermittent advancing of the tube continue progressively;

and at a location intermediate said assembly advancing step and said tube shaping step, accumulating the uninterruptedly advancing assembly to compensate for dwells in the intermittent advance of the tube.

4,355,495

METHOD AND APPARATUS FOR HANDLING PACKAGING CONTAINERS

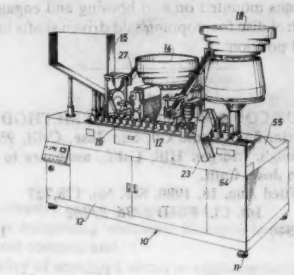
Roy D. Lewis, Farjestaden, and Bernt V. Borg, Kalmar, both of Sweden, assignors to Norden Packaging Machinery Aktiebolag, Sweden

Filed Jan. 16, 1980, Ser. No. 112,546

Claims priority, application Sweden, Jan. 17, 1979, 7900398

Int. Cl.³ B65B *43/00, 3/12, 3/14*

U.S. Cl. 53—579 **13 Claims**



1. An apparatus for handling of containers in which each of said containers includes a sleeve having a closed end surface having an opening extending therethrough and an open end displaced from said closed end surface, and an associated displaceable plunger for sealingly engaging the inner sidewall of said sleeve and being displaceable along the length of said sleeve between said open end and said closed end surface, said apparatus comprising:

an endless conveyor having at least one socket thereon and being operable to move said at least one socket along a path of movement;

first insertion means for inserting a plunger into said at least one socket on said conveyor means as said at least one socket moves therepast, said first insertion means being located at a first location along said path of movement;

second insertion means for inserting a sleeve into said one socket in a manner to receive said plunger in said open end thereof, said second insertion means being located at a second location displaced from said first location along said path of movement;

displacing means for displacing said plunger towards said closed end surface of said sleeve after said plunger and said sleeve have been inserted into said at least one socket on said conveyor means, said displacing means being located at a third location displaced from said first and second locations along said path of movement; and

filling means for filling said container with a material through said opening in said closed end surface of said sleeve and for simultaneously moving said plunger in a direction away from said opening of said closed end surface towards said open end of said sleeve as said container is filled through said opening, said filling means being located at a fourth location displaced from said first, second and third locations along said path of movement.

4,355,496

WRAPPING MACHINE AND METHOD

N. Grove Teates, Wheaton, and Riley H. Mayhall, Jr., Burtonsville, both of Md., assignors to Systemation Inc., Wheaton, Md.

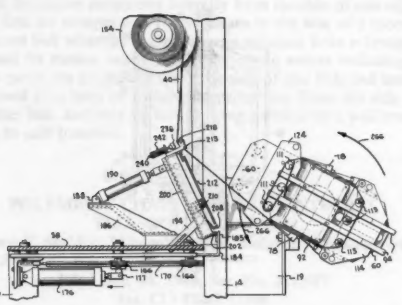
Filed Mar. 31, 1978, Ser. No. 893,324

Int. Cl.³ B65B *11/04, 13/04*

U.S. Cl. 53—587 **14 Claims**

1. A package wrapping machine comprising frame means, a power driven rotary member mounted on said frame means for

movement with respect to said frame limited solely to rotation about a horizontal axis, a loading and wrapping station including clamping means mounted on said rotary member for linear movement thereon and rotation therewith about said horizontal axis while clamping and holding package components to be wrapped, power drive means carried on said rotary member for actuating said clamping means, plastic film feeding and supply means mounted on said frame means for providing a web of plastic film extending to said clamping means and package components held by clamping means so that rotation of said rotary member and said clamping means about said horizontal axis effects the wrapping of said package components by said web of plastic film while said package components are held by said clamping means, film cut-off means for severing the web of plastic film from the wrapped package following the wrapping of the package, control means for actuating said clamping means, said rotary member and said film cut-off means in timed sequence, wherein said plastic film feeding and supply means includes roll support means supporting a roll of plastic film for rotation about a horizontal axis at a fixed location on said frame means, a carriage mounted for reciprocation between inner and outer limit positions toward and away from package components held by said clamping means, film guide means mounted on said carriage, said web of



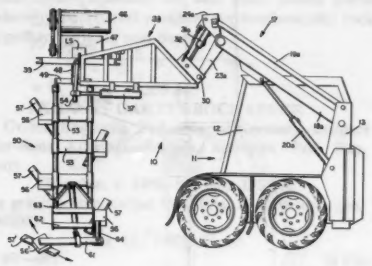
plastic film extending through said film guide means, said film cut-off means comprising an elongated heated means supported on said carriage for engagement with said web upon movement of said carriage toward said package through a position near said inner limit position, carriage support means supporting said carriage for reciprocation between said inner and outer limit positions, a vertically extending swing gate extending upwardly from said carriage, pivotal support means on said carriage supporting said swing gate along a lower portion thereof for pivotal movement about a horizontal axis, a back plate on said swing gate facing said package components, said swing gate being pivotable between an erect position in which said back plate is vertically oriented and a canted position in which the upper portion of said back plate is tilted away from said package components toward the outer limit position of said carriage, said back plate being oriented in its vertical position when said carriage is in its inner limit position and serving as a positioning means against which the components of a package to be wrapped are positioned preparatory to the clamping thereof by said clamping means and power tilt means mounted on said carriage for moving said back plate between its vertical position and its canted position and carriage drive means for moving said carriage between its inner limit position and its outer limit position.

4,355,497

APPARATUS FOR TRIMMING TREES

Bruce Murphy, Rte. 2, Coolidge, Ga. 31738

Filed Jan. 5, 1981, Ser. No. 222,656
Int. Cl.³ A01D *55/18*
U.S. Cl. 56—235 **12 Claims**



1. Apparatus for trimming living trees or the like, comprising:

motive means operative to traverse the ground adjacent a row of trees to be trimmed;

boom means mounted on said motive means and having a free end selectably operative to be adjustably positioned in predetermined relation to a tree to be trimmed;

cutter support means depending from said outer end of said boom means;

interconnection means interposed between said cutter support means and said outer end, and selectably operative to position said cutter support means relative to said boom means;

tilt responsive means responsive to the angular position of said cutter support means and operative to provide signals responsive to the angular position of said cutter support means with respect to a predetermined reference attitude; and

said interconnecting means being operative in response to said signals from said tilt responsive means to maintain said cutter support means in a certain angular position relative to said reference attitude, irrespective of the angular position assumed by said motive means or said boom means.

4,355,498

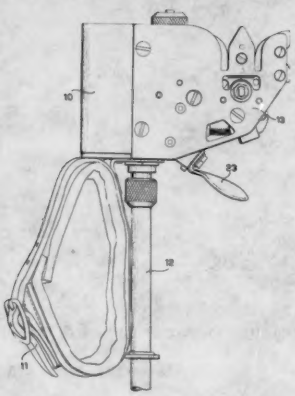
DEVICE FOR SPLICING TEXTILE YARNS WITH THE AID OF COMPRESSED AIR

Luciano Bertoli, Salo', Italy, assignor to Mesdan S.p.A., Brescia, Italy

Filed Jun. 11, 1981, Ser. No. 272,728
Claims priority, application Italy, Jun. 13, 1980, 22768 A/80
Int. Cl.³ B65H *69/06;* **D02J** *1/08*
U.S. Cl. 57—22 **6 Claims**

1. A device for splicing textile yarns by admixing and intermingling their component fibers with the aid of compressed air, which comprises a blending chamber having a substantially V-shaped cross-sectional outline and having a port opening centrally through its bottom wall and connected through a cutoff valve to a source of compressed air, a lid for closing said chamber frontally means for shifting said lid from an inoperative position away of said chamber to a position of closure of said chamber and vice versa, means synchronized with said lid-shifting means to open said valve as the lid is in its closed position, and members for positioning and introducing the yarns to be spliced in the blending chamber and for severing the free ends thereof, said members being controllable synchronously with the motion of said lid from its inoperative position to the position of closure of the blending chamber, the device being characterized in that it is comprised of a pneumatic control unit having an air intake duct connected to a

source of compressed air and an air outlet duct in direct communication with said port opening into the blending chamber, said air intake duct communicating with the outlet duct through a channel in which said cutoff valve controllable by said means synchronized with said lid-shifting means is inserted



serially with a second cutoff member, there being formed in the pneumatic control unit a timing reservoir connected through a passageway to a point, downstream of said second cutoff members, of said communication channel, said reservoir having at least one wall shiftable against the bias of resilient means and carrying said second cutoff member.

4,355,499

FABRICS HAVING SALT-AND-PEPPER PATTERNS AND CRIMPED FILAMENT YARNS FOR PRODUCING THE SAME

Isao Takai, Komatsu, Japan, assignor to Oda Gosen Kogyo Kabushiki Kaisha, Komatu, Japan

Filed Mar. 18, 1980, Ser. No. 131,314

Claims priority, application Japan, May 16, 1979, 54-59094; May 16, 1979, 54-59095

Int. Cl.³ D02G *3/26, 3/34, 3/40*

U.S. Cl. 57—205 **8 Claims**

6. A crimped filament yarn, comprising first portions each being twisted in one direction and relatively tightly bundled and locally fused together and second portions twisted in the other direction while being bundled relatively loosely, said first and second portions being distributed alternately along the length of the filament yarn.

4,355,500

PNEUMATIC YARN GUIDING APPARATUS FOR DOUBLE TWISTING MACHINE

Hideo Yanobu, and Kazuyuki Fujiwara, both of Kyoto, Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

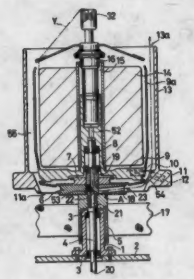
Filed Jan. 21, 1980, Ser. No. 113,645

Claims priority, application Japan, Jul. 23, 1979, 54-102232[U]; Jul. 25, 1979, 54-103255[U]; Jul. 27, 1979, 54-96431

Int. Cl.³ D01H *15/00, 7/86*

U.S. Cl. 57—279 **6 Claims**

1. In a textile yarn processing machine, such as a two-for-one twister or the like, having a spindle assembly including a driven rotor mechanism defining a vertically extending yarn passageway and a horizontally extending passageway mating with said vertically extending passageway, a carrier means for carrying a hollow package of yarn and rotatably mounted on said rotor mechanism so that said rotor mechanism may rotate relative thereto, said carrier means including a basket device surrounding the package of yarn carried thereby so that yarn withdrawn from the package can form a balloon over said basket device as it passes from said rotor mechanism, a balloon limitor device surrounding said basket device so that the yarn balloon will pass between said basket device and said balloon limitor device in a generally upward vertical path of travel, air operated threading mechanism for automatically threading yarn pulled from said package through said passageways of said rotor mechanism, said threading mechanism comprising means for supplying air under pressure through said passageway so that yarn pulled from said package will be pulled downward through said vertically extending passageway and outwardly through said horizontally extending passageway; the improvement comprising tension means disposed toward the upper part of said vertical passageway, and an inclined surface means disposed in the vicinity of said mating of said



vertical and said horizontal passageways, said inclined surface means having an air outlet provided at about the center or lower portion of said inclined surface so that yarn passing from the vertical passageway to the horizontal passageway will be acted upon by air passed through said air hole at substantially the turning point of the yarn from vertical to horizontal positions, whereby during threading operation said tension means is moved from the threading path of said yarn and cooperatively said air is supplied through said air hole of said inclined surface, thereby to produce a smooth and uninterrupted threading of said yarn, wherein said tension means comprises a guide tube having an inclined portion on the lower end thereof and a collar, said guide tube being inserted and fitted in said spindle assembly, and wherein said tension means further comprises a tensor and a yarn contact guide so that the central axial line of said yarn guide tube coincides with the central axial line of an opening of said yarn contact guide, and is normally urged upward by a spring winding around said collar, whereby the inclined portion of said yarn guide tube falls in contact with said tensor to displace the tensor from the central axial line of the opening of said yarn contact guide when the yarn guide tube is brought down against said spring.

4,355,501
EXPANSION BAND, SUCH AS A WATCH BAND, JEWELRY BAND OR THE LIKE

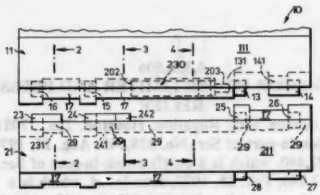
Bernhard Tesch, Ennetbuergen, Switzerland, assignor to Zwyro A.G., Schaffhausen and Tesch A.G., Ennetburgen, both of, Switzerland

Continuation of Ser. No. 941,251, Sep. 11, 1978, abandoned. This application Jun. 2, 1980, Ser. No. 155,230

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1977, 2740916

Int. Cl.³ F16G *13/00*

U.S. Cl. 59—82 **17 Claims**



1. An expansion band particularly adapted for use as a watchband, jewelry band, bracelet or the like comprising a plurality of links, means pivotally connecting adjacent links to each other, means for locking adjacent links to each other, adjacent links having sides in contiguous relationship to each other, fin means projecting laterally from the side of one adjacent link for reception in recess means in the side of a second adjacent link whereby a gap between adjacent links is bridged by said fin means, said pivotal connecting means including a male pivot pin projecting from the side of one link and being received in a bore of a trunnion projecting from the side of another link, and said fin means being defined by a wall common to said trunnion.

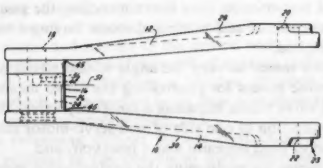
4,355,502
POLYMERIC CHAIN LINK WITH INTEGRAL TELESCOPING BARREL

Jerome F. Sheldon, Milwaukee, Wis., assignor to Rexnord Inc., Milwaukee, Wis.

Filed Dec. 24, 1980, Ser. No. 219,687

Int. Cl.³ F16G *13/06*

U.S. Cl. 59—84 **10 Claims**



1. A polymeric chain link, comprising:

first and second sidebars, each of said sidebars having a bore through both ends; and

a hollow cylindrical barrel connected to one end of said first sidebar and to one end of said second sidebar, said barrel comprising:

a. a male barrel portion integral with said first sidebar and projecting inward from said first sidebar at one end, said male barrel portion including an outer mating surface in which an annular surface portion of relatively small outer diameter is bounded on both sides by surface portions of larger diameter; and

b. a female barrel portion integral with said second sidebar and projecting inward from said second sidebar at one end, said female barrel portion including an inner mating surface in which an annular surface portion of relatively small internal diameter is bounded on both sides by surface portions of larger diameter, said inner mating surface being complementary in shape to said outer mating surface, such that said barrel portions are adapted to be coupled by inserting said male barrel portion into said female barrel portion until said annular surface portion of small internal diameter on said female barrel portion fits into said annular surface portion of small outer diameter on said male barrel portion, whereby said barrel portions are mechanically locked together, forming said barrel.

4,355,503
EXHAUST GAS TURBOCHARGER

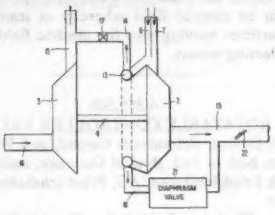
Michael Grohn, Esslingen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jan. 9, 1980, Ser. No. 110,702

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1979, 2901041

Int. Cl.³ F02B *37/00*

U.S. Cl. 60—602 **18 Claims**



1. An exhaust gas turbocharger for a vehicle engine, the exhaust gas turbocharger including a turbine means, a compressor means, the turbine means including a rotor means operatively connected to the compressor means, and a spiral housing means, a plurality of inlet channel means provided in said spiral housing means, the inlet channel means are combined only directly ahead of and at a periphery of the turbine rotor means, characterized in that a circumferential substantially circular edge is formed in an outer surface of the rotor means, annular channel means are provided for conducting a flow of exhaust gases, and annular gap is provided within an area of the circular edge for enabling a part of the exhaust gases to flow from the spiral housing means into the annular channel means, the compressor means includes a charging air channel means, a return line communicating the annular channel means with the charging air channel means, a turbine exhaust gas line is provided, and a bypass line means for bypassing the turbine means leads to the turbine exhaust gas line, and in that said return line and the bypass line means branch off from the annular channel means.

4,355,504
APPARATUS FOR REDUCING PARTICLES DISCHARGED BY COMBUSTION MEANS

Benjamin Y. H. Liu, North Oaks; David B. Kittelson, Minneapolis; Daniel F. Dolan, St. Anthony, and David Y. H. Pui, Minneapolis, all of Minn., assignors to The Regents of the University of Minnesota, Minneapolis, Minn.

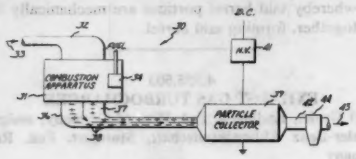
Division of Ser. No. 38,077, May 11, 1979, Pat. No. 4,304,096. This application Dec. 11, 1980, Ser. No. 215,460

Int. Cl.³ F01N *3/00*

U.S. Cl. 60—275 **60 Claims**

1. An apparatus for reducing the amount of particles discharged into the atmosphere comprising: first means having at least one combustion chamber for receiving hydrocarbon fuel and air and accommodating combustion of the fuel and air, said

combustion imparting electrical charges on at least some of the particles formed during the combustion of the fuel and air, during said imparting of electrical charges on the particles a substantially equal number of particles are positively charged and negatively charged whereby the particles as a whole are a substantially electrical neutral mass of particles, particle collecting means for collecting at least some of the charged particles, second means for directing the charged particles from the



combustion chamber directly to the particle collecting means without subjecting the charged particles to a charging step with an intermediate particle charging means whereby the electrical charges on the particles remains substantially the same, and means associated with the particle collecting means to establish an electric field whereby at least some of the charged particles moving into the electric field are collected on the collecting means.

4,355,505

ROTATABLE CONTROLLER VALVE

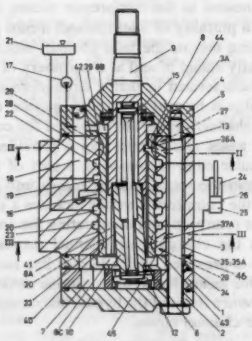
Karl-Heinz Liebert, Schwabisch Gmund, and Werner Tischer, Bobingen, both of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen, AG, Friedrichshafen, Fed. Rep. of Germany

Filed Apr. 2, 1980, Ser. No. 136,471

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1979, 2917298

Int. Cl.³ F15B *13/04*

U.S. Cl. 60—384 **8 Claims**



8. In a fluid power steering system having a source of pressurized fluid (**17**), a fluid metering device (**1–6**), a servomotor (**26**), controller valve means for conducting flow of the pressurized fluid between the source and the servomotor through the metering device, including a valve housing (**3**), a tubular valve element having opposite axial end portions enclosed in the housing, valve actuating drive means (**9, 13, 14**) operatively connected to the valve element for imparting axial and angular displacement thereto, passage means in the valve housing and the valve element for controlling said flow of the fluid in response to said axial displacement of the valve element, and torsional coupling means operatively connecting the fluid metering device to the valve element for controlling operation of the metering device in response to said angular displacement of the valve element, the improvement residing in means for enhancing end bearing support of the valve element in the housing at said opposite axial end portions, including pressure spaces (**8B, 8C**) formed in the housing into which the axial end portions of the valve element extend, and means for establishing fluid communication between said pressure spaces and the passage means including distributor grooves (**29, 30**) formed externally in the valve element at said axial end portions thereof.

4,355,506

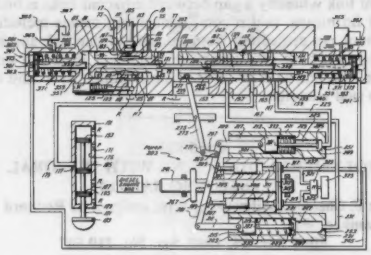
PUMP-MOTOR POWER LIMITER AND PRESSURE RELIEF

Willie B. Leonard, 5902 Royalton, Houston, Tex. 77081

Continuation-in-part of Ser. No. 828,045, Aug. 26, 1977, Pat. No. 4,227,440, which is a continuation-in-part of Ser. No. 772,560, Feb. 28, 1977, abandoned, which is a continuation-in-part of Ser. No. 622,760, Oct. 15, 1975, Pat. No. 4,094,229, which is a continuation-in-part of Ser. No. 521,036, Nov. 5, 1974, Pat. No. 4,046,059, which is a continuation-in-part of Ser. No. 489,829, Jul. 18, 1974, Pat. No. 3,988,966. This application Apr. 25, 1979, Ser. No. 33,036

Int. Cl.³ F16H *39/46*

U.S. Cl. 60—389 **20 Claims**



1. In combination with a pump-motor hydraulic power transmission system including a pump, a motor, and two hydraulic fluid transmission lines interconnecting the pump and motor, at least one of said pump and motor having a variable angle swash-plate,

servo motor means to vary the angle of said swash plate,

control valve means for controlling the servo means, said control valve means including a three-way valve for alternate connection of one side of said servo-motor means to a source of fluid pressure and a reservoir, and

operator means for positioning the control valve means;

travel limit means at each opposite end of said three-way valve positionable in the path of travel of said three-way valve for abutment therewith and

motor means associated with each respective travel limit means and responsive to the pressure in the higher pressure one of said transmission lines to adjust the position of a said respective travel limit means,

a spring means biasing each of said motor means to a position where said travel limit means is disengaged from said three-way valve,

said travel limit means being movable between

(1) a normal position disengaged from said three-way valve,

(2) positions in the path of travel of said three-way valve but out of contact therewith, and

(3) positions in abutting engagement with said three-way valve and determining the position of the three-way valve.

4,355,507

SYSTEM FOR INFRARED EMISSION SUPPRESSION (SIRES)

Clayton G. Coffey, Medicine Hat; Stephen B. Murray, Montreal, and Donald L. Bayly, Calgary, all of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Jun. 25, 1980, Ser. No. 162,931
Claims priority, application Canada, Aug. 9, 1979, 333602
Int. Cl.³ F02K *3/04*; F23L *13/00*; B64D *33/04*
U.S. Cl. 60—39.5 14 Claims

1. Film cooling apparatus adapted to be connected into a conduit carrying a hot gaseous medium, said apparatus comprising:

contoured duct means for channeling the gaseous medium having an external surface, an internal surface, and a single thickness of material therebetween, said contoured duct means adapted to be connected to said conduit and having slot means for the passage of coolant fluid therein;

a central body aerodynamically shaped and supported within said contoured duct means so as to form therewith an annular channel having a zero pressure gradient, said central body having slot means therein to enable cooling flow of a coolant fluid over exterior surfaces of the central body for maintaining an acceptably low surface temperature thereof;

a network of ducting to interconnect the contoured duct means and interior of the central body to a source of said coolant fluid, said network of ducting and said contoured duct means defining a plenum chamber therebetween which is adapted to be in flow communication with said source of coolant fluid; and

an entraining diffuser section connectible to downstream portions of the contoured duct means and operative to promote the entrainment of further quantities of a coolant fluid and to promote the deceleration of exhaust gases for the purposes of energy recovery.

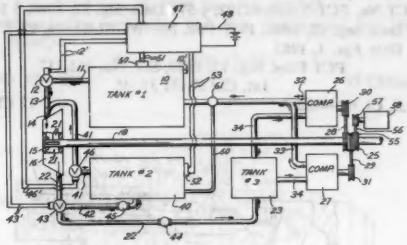
4,355,508

AIR POWER MOTOR

Joseph F. Blenke, and Stanley J. Blenke, Sr., both of Three Oaks, Mich., assignors to U.S. Foam Mfg. Co., Inc., Three Oaks, Mich.

Filed May 2, 1980, Ser. No. 146,042
Int. Cl.³ F16D *31/02*
U.S. Cl. 60—416 5 Claims

1. An air power motor comprising, a first tank adapted to be pressurized with compressed air; an air reactance means having air inlet port, an air outlet port circumferentially spaced from said outlet port, and a drive shaft, conduit means for conducting compressed air from said first tank to the inlet port of said reactance member; a second tank connected to receive reduced pressure air from said reactance member, a compressor driven by said shaft to pressurize said second tank with compressed air at lower pressure than said first tank and con-



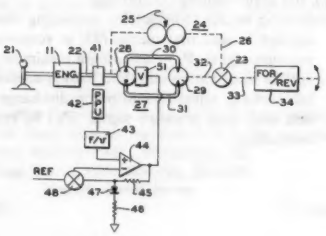
duit means for conducting compressed air from said second tank to said reactance member to supplement the driving force exerted by air from said first tank.

4,355,509

SPLIT TORQUE TRANSMISSION CONTROL

Thomas R. Fulkerson, Watertown, and Royal R. Hawkins, Bloomington, both of Minn., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 31, 1979, Ser. No. 108,871
Int. Cl.³ F15B *7/00*
U.S. Cl. 60—449 20 Claims



1. A system for controlling a split torque transmission of a vehicle comprising, the split torque transmission including first and second throughputs and a summing junction connected to the first and second throughputs and having a transmission output dependent upon said first and second throughputs, each throughput having an input connected to an output of an engine of the vehicle,

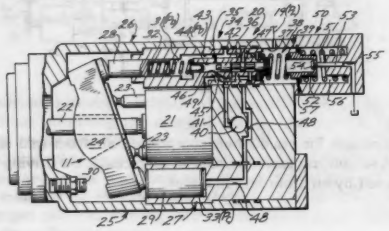
sensing means adapted to sense the output of said engine; and

control means connected to said sensing means and adapted to control said second throughput solely dependent upon said engine output, said second throughput being controlled from a negative value cancelling said first throughput to a positive value so that said transmission output is varied from idle to a predetermined value.

4,355,510
UNLOADING MEANS FOR FLOW-PRESSURE COMPENSATED VALVE

Walter Z. Ruseff, New Lenox, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US80/01192, § 371 Date Sep. 12, 1980, § 102(e) Date Sep. 12, 1980, PCT Pub. No. WO82/01044, PCT Pub. Date Apr. 1, 1982
PCT Filed Sep. 12, 1980, Ser. No. 261,117
Int. Cl.³ F16H 39/46
U.S. Cl. 60—452 12 Claims



1. In a fluid circuit (10) having a fluid actuator (13), a variable displacement pump (11) including a control member (24) movable between first and second displacement positions, first biasing means (26) for urging said control member (24) towards its first displacement position, second biasing means (27) for urging said control member (24) towards its second displacement position in opposition to said first biasing means (26) and in response to a variable control pressure (P_C), first means (35) for varying said control pressure (P_C) in response to variations in the discharge pressure (P_D) of said pump (11), second means (37) for controlling said first means (35) to modulate said control pressure (P_C) in response to variations in a load pressure signal (P_L) received from said fluid actuator (13), and third biasing means (38) for applying a margin force to said first means (35) to maintain a pressure differential between said pump discharge pressure (P_D) and said load pressure signal (P_L) during a predetermined range of said load pressure signal (P_L), the improvement comprising:

unloading means (50/50a) for unloading the margin force applied to said first means (35) in response to said load pressure signal (P_L) exceeding a maximum pressure level and for inactivating said third biasing means (38) to at least substantially equalize said pump discharge pressure (P_D) and said load pressure signal (P_L) in response to said unloading.

4,355,511
WAVE ENERGY CONVERSION

Dedger Jones, 885 Freeway Dr. North, Columbus, Ohio 43229

Continuation-in-part of Ser. No. 817,973, Jul. 22, 1977, abandoned. This application Jun. 23, 1978, Ser. No. 917,363
Int. Cl.³ F03B 13/12; F04B 17/00
U.S. Cl. 60—507 49 Claims

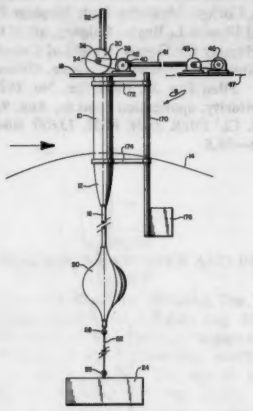
1. A method for converting the energy of waves generated within a large body of water into useful power comprising the steps of:

providing a buoyant body floatable within said water;

submerging said buoyant body to a predetermined level beneath the immediate surface of said water when situated at the trough of a given said wave;

retaining said buoyant body at said level of submergence;

releasing said retained buoyant body for vertical flotational movement through the crest defined portion of a said wave; and

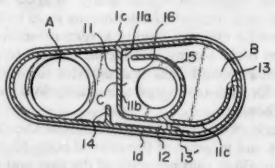


converting said vertical flotational movement into useful power.

4,355,512
RESERVOIR FOR USE WITH TANDEM MASTER CYLINDER

Hitoshi Kubota, Fujisawa; Toshiyuki Takahashi, Hayamamachi, and Yoshihiro Hayashida, Kawasaki, all of Japan, assignors to Nissan Motor Company, Ltd., Yokohama, Japan

Filed Oct. 15, 1980, Ser. No. 197,129
Claims priority, application Japan, Oct. 17, 1979, 54-143594[U]
Int. Cl.³ B60T 17/22
U.S. Cl. 60—534 4 Claims



1. A reservoir for use with a tandem master cylinder comprising: an elongated housing generally extending along the longitudinal axis of the master cylinder and including top and bottom walls and first and second side walls, said housing defining therein a first chamber, a second chamber, and a liquid level warning device receiving chamber positioned between said first and second chambers, first and second outlets provided respectively in said first and second chambers in communication with the master cylinder, a partitioning wall extending between the top and bottom walls and having laterally and longitudinally extending portions, said laterally extending portions extending from the first side wall to an end adjacent to the second side wall and thereby partitioning the first chamber and the liquid level warning device receiving chamber, said longitudinally extending portion extending from said end along the second side wall and being spaced therefrom by a small distance to define a corridor-like passage communicating the second and the first chambers, and an additional wall extending between the top and bottom walls laterally from the longitudinally extending portion of said partitioning wall to the first side wall, said additional wall partitioning the second chamber and

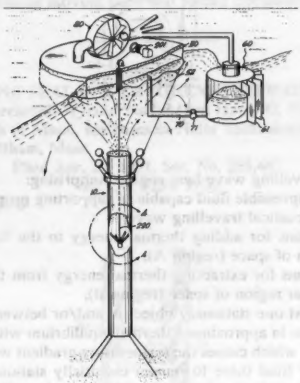
the liquid level warning device receiving chamber and including a slit extending between the top and bottom walls.

4,355,513

METHOD AND APPARATUS FOR PRODUCING ELECTRICITY FROM THERMAL SEA POWER

Barney B. Girden, 1281 NW. 43rd Ave., Lauderhill, Fla. 33313

Filed Mar. 6, 1980, Ser. No. 127,642
Int. Cl.³ E03G 7/04
U.S. Cl. 60—641.7 10 Claims



1. An improved method of producing useful energy from the thermal power of a large body of water, having a depth of at least 700 feet and having cold subsurface water and warmer surface water comprising the steps of:

upwelling said cold subsurface water creating an area of cold subsurface water on the surface of said body of water said area being surrounded by the warmer surface water; and,

positioning a substantially vertical duct within said body of water, said duct having an open lower end located within said cold subsurface water and an open upper end positioned within said warmer surface water; and,

releaing a multitude of compressed air bubbles through an air jet assembly positioned within the upper portion of said duct to create a buoyant mixture of air bubbles and water above said release point, said buoyant mixture causing a lessened weight of the total water within the duct thereby forcing cold subsurface water into the open bottom end of the duct, rising up within the duct, being mixed with the released air bubbles and finally surfacing at and becoming the surface of said body of water; and, adjusting the depth of said air jet asembly within said upper portion of said duct until the bubbles' size achieve their greatest lifting power and to adjust the weight difference between the water within the duct and an equivalent volume of water outside the duct thereby adjusting the eddy velocity of the water within the duct; and,

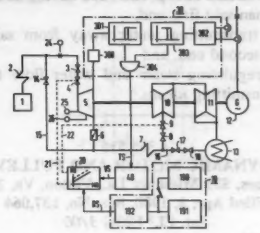
utilizing the temperature differential between said area having cold subsurface water thereon and said surrounding warmer surface water to generate electricity.

4,355,514

CONTROL DEVICE FOR STEAM TURBINES WITH REHEATER

Rolf Reifenberg, Mülheim, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Sep. 29, 1980, Ser. No. 191,843
Claims priority, application Fed. Rep. of Germany, Sep. 28, 1979, 2939534
Int. Cl.³ F01K 13/02
U.S. Cl. 60—660 15 Claims



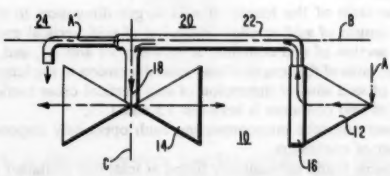
1. Control device for a steam turbine having a high-pressure and a medium or low-pressure turbine part, comprising a reheater, at least one live steam control valve disposed upstream of the high-pressure turbine part, at least one intercept control valve disposed upstream of the medium or low-pressure turbine part and downstream of said reheater, control means having at least one turbine controller for simultaneously acting on said live steam control valve in accordance with a predetermined live steam valve characteristic and acting on said intercept control valve in accordance with a predetermined intercept valve characteristic, said live steam control valve and said intercept control valve having a normal characteristic correlation therebetween determining a correlation of high-pressure and medium or low-pressure steam mass flow, limit detecting means associated with said high-pressure turbine part for responding when a predetermined thermal stress is reached in said high-pressure turbine part, and positioning means controlled by said limit detecting means for changing said normal characteristic correlation and increasing said high-pressure steam mass flow in said steam mass flow correlation.

4,355,515

MOISTURE REMOVAL STRUCTURE FOR CROSSOVER CONDUITS

Albert Cohen, Nether Providence; Ralph D. Brown, Springfield, and William D. Scott, Upper Chichester, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 3, 1980, Ser. No. 183,688
Int. Cl.³ F01K 21/06
U.S. Cl. 60—657 2 Claims



1. A steam turbine apparatus comprising:

first and second turbine sections respectively including exhaust and inlet portions; and

a steam crossover structure for transmitting steam from said exhaust portion to said inlet portion, said crossover structure including a conduit having a longitudinal axis perpendicular to the longitudinal axis of said inlet portion and a moisture removal structure disposed beyond said inlet portion in the direction of steam flow through said conduit, said moisture removal structure constituting

a tapered transition section having first and second ends, said first end being adjacent said inlet portion and having an inside diameter at least as large as said conduit's inside diameter, said second end being disposed relatively remotely from said inlet portion and having an inside diameter less than said first end,

means for transmitting water away from said transition section's second end, and

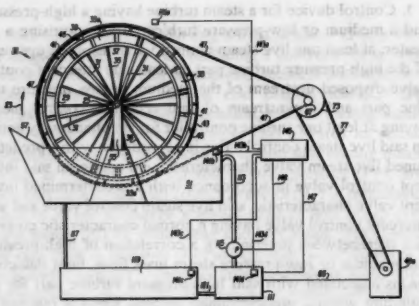
means for regulating steam and water flow through said water transmitting means.

4,355,516

THERMODYNAMIC MOTOR AND PULLEY SYSTEM

Charles V. Jones, 539 Missimer La., Vinton, Va. 24179

Filed Apr. 3, 1980, Ser. No. 137,064
Int. Cl.³ F03G *3/00*
U.S. Cl. 60—675 **11 Claims**



1. A thermodynamic motor and pulley system comprising:

an essentially cylindrical frame rotatable about a horizontal axis, said frame having an essentially vertical cross section, said horizontal axis extending through the center of said frame vertical cross section;

a plurality of oppositely disposed pairs of containers mounted on said frame, each of said containers having an essentially rectangular vertical cross section, wherein a larger dimension of said rectangular vertical cross section is oriented essentially tangentially with respect to said cylindrical frame, a smaller dimension of said rectangular vertical cross section is oriented essentially orthogonally to said larger dimension, and an axial dimension of said container is oriented essentially parallel to said axis, and wherein

the ratio of the length of said larger dimension to the length of said smaller dimension of said vertical cross section of said container is between 3:1 and 1:1; and,

the ratio of the length of said axial dimension to the length of said smaller dimension of said vertical cross section of said container is between 1:5 and 1:15;

at least one tube interconnecting each oppositely disposed pair of containers;

a volatile liquid substantially filling at least one container of each pair;

means to effect a temperature differential between the containers in each pair to cause said volatile liquid in one such container to transfer through said interconnecting tube to the other container paired therewith, thereby shifting the center of gravity of said pair of containers about said axis to cause the rotational motion of said frame; and,

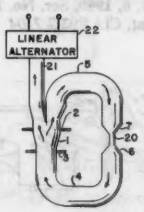
transmission means extending semi-circumferentially around said frame, said transmission means being ultimately connected to a rotationally driven member, said transmission means being adapted to transmit the rotational motion of said frame to said rotationally driven member.

4,355,517

RESONANT TRAVELLING WAVE HEAT ENGINE

Peter H. Ceperley, 4803 Clemons Ct., Annandale, Va. 22003

Filed Nov. 4, 1980, Ser. No. 204,328
Int. Cl.³ F03G *7/00*
U.S. Cl. 60—721 **7 Claims**



1. A travelling wave heat engine comprising:

a. a compressible fluid capable of supporting propagation of an acoustical travelling wave,

b. a means for adding thermal energy to the fluid in one region of space (region A),

c. a means for extracting thermal energy from the fluid in another region of space (region B),

d. at least one stationary object in and/or between the two regions in approximate thermal equilibrium with the fluid there, which causes the temperature gradient which exists in the fluid there to remain essentially stationary in the presence of wave induced fluid motion through the gradient, and

e. a means for causing an acoustical travelling wave to propagate on a path through the fluid from region B, through the region of stationary temperature gradient, into region A, in such a manner that the wave moves fluid back and forth through the stationary temperature gradient and so causes the fluid there to be heated and/or cooled in conjunction with the compression and expansion of the wave, for the purpose of transforming energy between the thermal form of the temperature gradient and the acoustical form of the travelling wave,

wherein the improvement comprises:

f. a means for superimposing a standing wave in with the travelling wave such that its velocity node and its pressure maximum are approximately positioned in the region of the stationary temperature gradient for the purpose of enhancing the pressure component of the travelling wave without appreciably increasing the velocity component for the purpose of causing a reduction in viscous losses in the regenerator for a given acoustical power level or increasing the maximum power throughput of the engine for a given viscous loss level.

4,355,518

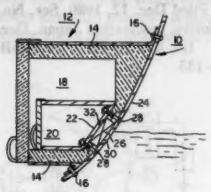
REFRIGERATOR-VEHICLE COMBINATION METHOD

Shlomo Beitner, Tel-Aviv, Israel, assignor to Bipol Ltd., Tel-Aviv, Israel

Filed Aug. 18, 1980, Ser. No. 178,924
Int. Cl.³ F25B *21/02*
U.S. Cl. 62—3 **18 Claims**

1. In a watercraft having an exterior wall at least part of which is exposed to ambient water, and apparatus within said

exterior wall for effecting refrigeration by means of a thermoelectric element having hot and cold faces adapted to be activated by the impression of a direct current potential across said faces, the improvement which comprises static heat-transfer



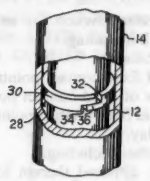
means for conducting heat from said hot face into the water to which said exterior wall is exposed, said static heat-transfer means being openly and unrestrictedly exposed to said water and being free of moving parts and forced circulation of coolant.

4,355,519

SPLIT RING SEAL FOR CRYOGENIC REFRIGERATOR

John E. Kercheval, Wyland/Natick, and Harry G. Nicoll, Norwell, both of Mass., assignors to Helix Technology Corporation, Waltham, Mass.

Filed Apr. 20, 1981, Ser. No. 255,467
Int. Cl.³ F25B *9/00*
U.S. Cl. 62—6 **10 Claims**



1. A refrigerator of the type comprising a displacer which reciprocates axially within a cylinder for expanding a refrigeration gas and a split seal positioned within a circumferential groove at the interface between the displacer and the cylinder, the seal having a split seal ring and a spring ring exerting a radial spring force on the seal ring, the split seal in the refrigerator characterized by:

loading means for exerting an axial spring force against on axially directed face of the seal ring to press that ring against one face of the circumferential groove and maintain continuous seals at the split in the seal ring and at said face of the groove.

4,355,520

PROCESS FOR THE SEPARATION OF SOLUTE IN CRYOHYDRATE AND APPARATUS THEREFOR

Toshio Kobayashi, Tokyo, Japan, assignor to Director of National Food Research Institute, Ministry of Agriculture, Forestry and Fisheries, Ibaraki, Japan

Filed Feb. 27, 1981, Ser. No. 239,138
Claims priority, application Japan, Mar. 29, 1980, 55-40853
Int. Cl.³ B01D *9/04*
U.S. Cl. 62—123 **5 Claims**

1. An apparatus for the separation of solute or solutes from a cryohydrate which comprises

an endless member fabricated of a material having a high tensile strength;

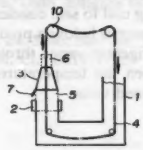
a reservoir to store a solution therein and including means for applying said solution to said endless member;

a freezing unit;

a pressure-application unit;

means for drawing said endless member sequentially through said solution applying means, said freezing unit and said pressure-application unit such that all surfaces of said endless member are enveloped in said solution, the solution enveloping said endless member being frozen onto said endless member as it is drawn through said freezing unit;

said pressure-application unit having fixed position and static pressure applying means, and being located downstream of said freezing unit and through which said endless member passes, said pressure applying means including a sleeve-like member surrounding a portion of said endless member and



extending longitudinally of said endless member, said sleeve-like member having static inner walls defining an inner sectional area which is reduced in the direction in which said endless member passes therethrough, the inner sectional area being positioned and dimensioned to apply surrounding pressure to frozen solution enveloping said endless member by applying pressure between opposing portions of said endless member and said inner walls of said sleeve-like member under drawing force applied to said endless member by said drawing means; and

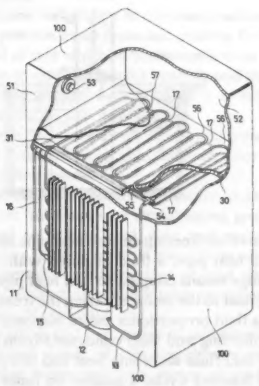
said pressure-application unit further including a liquid receiving reservoir at a lower portion thereof.

4,355,521

REFRIGERATOR-OVEN COMPLEX

Yun-Ting Tsai, 7, Chung Cheng Rd., Sec. 1, Yangmingshan, Taipei, Taiwan (113)

Filed Sep. 19, 1980, Ser. No. 188,928
Int. Cl.³ F25B *41/00, 29/00*
U.S. Cl. 62—196 B **10 Claims**



1. A refrigerator-oven complex comprising a refrigerator space and an oven space thermally insulated from one another, and a refrigerating-heating system for cooling said refrigerator space and for heating said oven space, said system containing a refrigerant and comprising a cooling coil in said refrigerator space, a heating coil in said oven space, a motor-driven compressor for compressing refrigerant vapor received from said

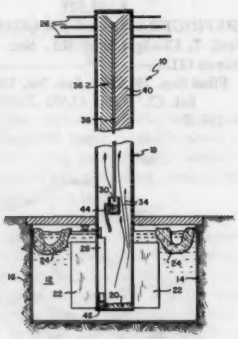
cooling coil, a condensor for compressed refrigerant vapor, a trident valve having an inlet connected with the output of said compressor, one outlet connected with an inlet of said heating coil and another outlet connected by a bridge pipe to an inlet of said condenser, an outlet of said heating coil being connected with an inlet of said condenser, refrigerant storage means having an inlet connected with an outlet of said condenser and an outlet connected through a controllable capillary valve with said cooling coil whereby said cooling coil with said capillary valve comprises a volitilator, means for sensing the temperature in said oven space, and means responsive to said sensing means for controlling said trident valve to direct hot compressed refrigerant vapor from said compressor through said heating coil to said condenser when the temperature in said oven space is below a predetermined value and to direct said hot refrigerant vapor through said bridge pipe to said condenser when the temperature in said oven space is above a predetermined value.

4,355,522

PASSIVE ICE FREEZING-RELEASING HEAT PIPE

Anthony J. Gorski, Lemont, and William W. Schertz, Batavia, both of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 29, 1980, Ser. No. 191,611
Int. Cl.³ F25C *1/00*
U.S. Cl. 62—340 **15 Claims**



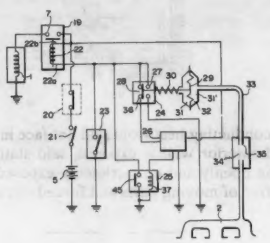
1. A passive ice freezing-release heat pipe assembly comprising a diode heat pipe, a fluid disposed within said heat pipe, heat exchange means coupled to said heat pipe and capable of dissipating heat to the ambient during the freezing cycle of said heat pipe, a fluid proportioner means disposed within said heat pipe for collecting said fluid condensed from the vapor phase formed by said fluid absorbing heat and thereby boiling away during the freezing cycle, a passive on timer means disposed within said heat pipe and for accumulating fluid collected by said fluid proportioner means, a passive off-timer means disposed within said heat pipe and for collecting fluid condensed from the vapor phase and for holding the fluid until the end of the defrost part of the freezing cycle, and a means disposed within said heat pipe and capable of effectuating fluid transfer from said off-timer means to said on-timer means precedent to the defrost part of the freezing cycle.

4,355,523

AUTOMATIC CAR-COOLER CLUTCH CONTROL APPARATUS

Yukio Shimada, Yokohama, Japan, assignor to Nissan Motor Company, Ltd., Yokohama, Japan

Filed Dec. 12, 1980, Ser. No. 215,826
Claims priority, application Japan, Dec. 18, 1979, 54-163467
Int. Cl.³ B60H *3/04*; F25B *27/00*
U.S. Cl. 62—133 **1 Claim**



1. An automatic car-cooler clutch control apparatus for an automobile having a passenger compartment, an engine with an intake manifold, and a cooler having a cooler compressor, said apparatus comprising:

(1) a clutch coil for engaging/disengaging said car-cooler compressor with the engine;

(2) a clutch relay connected to said clutch coil for energizing said clutch coil;

(3) a vacuum pressure switch for energizing said clutch relay, said switch including:

(a) a movable contact;

(b) a first pair of fixed contact points; and

(c) a second pair of fixed contact points, one terminal of each pair of said fixed contact points being connected to said clutch relay;

(4) a vacuum chamber including:

(a) a diaphragm disposed therein so as to provide two separate compartments, one being communicated with the atmosphere and the other being communicated with said intake manifold, said diaphragm being directly connected to said movable contact; and

(b) a spring for urging said movable contact toward said first pair of fixed contact points when a vacuum pressure within the intake manifold is less than a predetermined value, said movable contact being brought into contact with the second pair of fixed contact points against the action of said spring when the vacuum pressure is more than the predetermined value; and

(5) a temperature switch connected in parallel with said vacuum pressure switch, said temperature switch being operatively connected to said passenger compartment and said clutch relay for energizing said clutch relay when the temperature within the passenger compartment rises above a predetermined value, regardless of the state of said vacuum pressure switch.

4,355,524

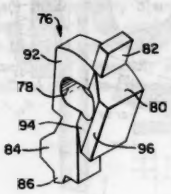
COMBINATION LOCKS

Lazlo Bako, Woodcliff Lake, N.J., assignor to Kidde, Inc. (Presto Lock Company Division), Garfield, N.J.

Filed Jul. 11, 1980, Ser. No. 167,919
Int. Cl.³ E05B *37/02*
U.S. Cl. 70—312 **9 Claims**

1. A combination lock including a plurality of combination elements disposed on a common axis in a casing for axial movement in unison out of coupling engagement with cooperating combination components in order to change the combination of the lock, a shift member for moving said elements axially, means mounting said shift member in said casing for movement

substantially transversely to said common axis, said shift member including an actuator portion extending through an opening in said casing and means providing a camming action between said shift member and said elements for causing said shift member to move said elements axially responsive to transverse movement of said shift member when operated by said actuator portion, wherein said shift member is located between said combination elements and a reaction surface of said casing



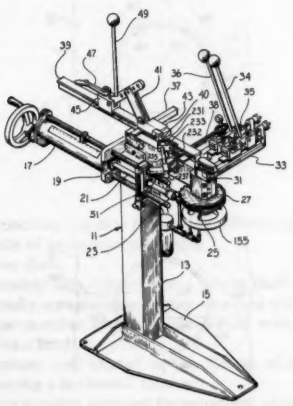
extending transversely to said axis and wherein said means providing a camming action includes a camming portion on a surface of said shift member facing the combination elements, the camming portion extending obliquely to said axis whereby movement of said actuator portion in said opening causes said camming surface to move said elements axially by reaction of said shift member with said reaction surface without axial movement of the shift member.

4,355,525

PRODUCTION TUBE BENDING MACHINE

James W. Carson, Rte. 1 Box 62, Fayetteville, Ark. 72701

Filed Sep. 4, 1979, Ser. No. 72,455
Int. Cl.³ B21D *7/04, 9/05*
U.S. Cl. 72—149 **10 Claims**



1. In a tubing bending machine including a linear actuator having an operating rod, a rotatable die table with a top adapted to support a die, a die with a bottom adapted to rest on said table, a tubing clamp, and a wiper block to bend a tubing workpiece, the improvement comprising,

a sprocket secured to rotate with said die table and clamp,

at least one projection on said top of said die table mating with a depression in said bottom of said die,

a draw bolt with a threaded upper end and a lower end,

a hand wheel secured to the lower end of said draw bolt, said draw bolt extending through said sprocket and die table and adapted to threadedly engage a tapped hole in the bottom of said die and secure it to said table,

a chain wrapped partially around said sprocket and having one end secured thereto; the other end of said chain being secured to the operating rod of said actuator, and

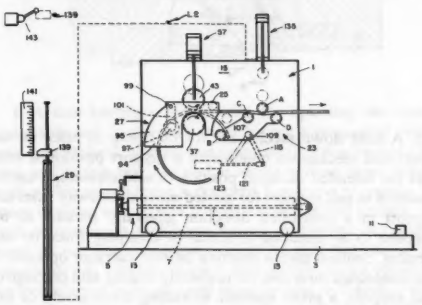
a torsion spring connected to said sprocket to rotate said sprocket in a direction to apply tension to said chain.

4,355,526

METHOD AND APPARATUS FOR UNCOILING AND STRAIGHTENING MATERIAL FOR PROCESSING THEREOF

John H. Miles, Ravenna, Ohio, assignor to Wean United, Inc., Pittsburgh, Pa.

Filed Mar. 24, 1980, Ser. No. 133,054
Int. Cl.³ B21F *1/02*
U.S. Cl. 72—164 **22 Claims**



1. In combination with an apparatus for uncoiling material such as wire from a circular coil and feeding it along a passline for further processing comprising:

means for uncoiling said coil in a manner that the leading end of the wire assumes its natural curvature,

bending means located along said passline constructed and arranged for receiving said wire upon its exit from said uncoiling means,

said bending means including a first means positionable in an inoperative position away from said passline for engaging a leading end of said wire and positionable in an operative position close to said passline for bending said leading end against its natural curvature to cause it to take a path generally parallel to said passline, and

wire straightener means located along said passline constructed and arranged to receive said wire after said wire exits said bending means,

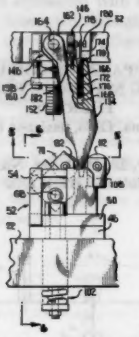
said straightener means including first means locatable close to said passline for assuming a straightening position with a longitudinal surface of said wire and second means positionable in a feeding position away from said passline and in an operative position close to said passline for assuming a straightening position with an opposite longitudinal surface of said wire, and

means for associating said first means of said bending means with said second means of said straightener means in a manner so that when said first means of said bending means is positioned in its said inoperative position away from said passline said second means of said straightener means is positioned in its said operative position close to said passline, and when said first means of said bending means is positioned in its said operative position close to said passline, said second means of said straightener means is positioned in its said feeding position away from said passline.

4,355,527
HOLD DOWN MECHANISM

Donald E. Miller, Mount Prospect, Ill., assignor to The Continental Group, Inc., Stamford, Conn.

Filed Nov. 12, 1980, Ser. No. 206,330
Int. Cl.³ B21D *22/00*
U.S. Cl. 72—351 13 Claims



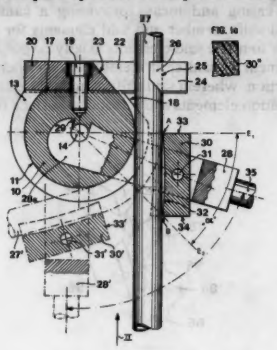
1. A hold down mechanism for clamping in place an element, said mechanism comprising a support positioned adjacent the intended clamped position of said element, a carrier mounted in said support for guided movement away from said support in a controlled direction generally parallel to but opposite to an intended direction of clamping force on said element, resilient means reacting on said carriage opposite to said controlled direction for resiliently seating said carriage on said support, a pivot member extending transversely of said controlled direction and being mounted on said carriage for movement therewith in said controlled direction against the restraint of said resilient means, a hold down arm carried by said pivot member for swinging movement between a retracted position and an element clamping position, a hold down surface projecting from said arm for clamping engagement with said element, and actuating means engageable with said arm for first pivoting said arm about said pivot member to engage said hold down surface with said element and effect clamping of said element in place and then pivoting said arm about said hold down surface while moving said carrier and pivot member in said controlled direction against the resistance of said resilient means to apply a resilient predetermined clamping force against said element.

4,355,528
DEVICE FOR BENDING METAL PIPE

Günter Rothenberger, Bad Homburg, Fed. Rep. of Germany, assignor to Rothenberger GmbH & Co., Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 21, 1980, Ser. No. 123,324
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1979, 2904885
Int. Cl.³ B21D *7/02*
U.S. Cl. 72—388 15 Claims

1. A bending device for metal pipe with and without plastic jacketing comprising: a short cylindrical segment including a circumferential groove which determines the bending radius of the pipe to be bent; support means for holding the pipe to be bent tangentially with respect to the groove; a lever; means mounting the lever for continuous concentric pivotable movement about the axis of the segment; a pressing block; means mounting the pressing block on the lever for pivotal movement about an axis parallel to the segment axis; and wherein the pressing block includes means forming a working surface which has an approximately semicircular, concave cross section in a plane disposed parallel to the pivot axis of the pressing

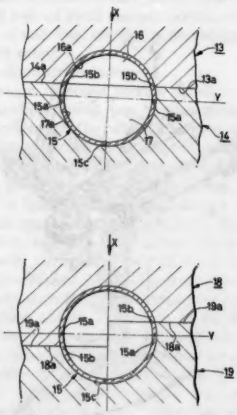


block and the segment axis and a concave cross section in a plane disposed perpendicular to those axes.

4,355,529
APPARATUS FOR MANUFACTURING A CYLINDRICAL MEMBER

Tatsuhiko Fukuoka; Shigeo Ichikawa, and Satoru Nomichi, all of Toyota, Japan, assignors to Taiho Kogyo Co., Ltd., Toyota, Japan

Filed Oct. 11, 1979, Ser. No. 84,034
Claims priority, application Japan, Oct. 16, 1978, 53/127017
Int. Cl.³ B21D *37/10*
U.S. Cl. 73—412 5 Claims



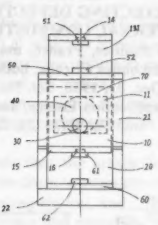
1. A sheet-shaping die structure for manufacturing a cylindrical article by bending a sheet, comprising: a pair of dies having opposed parallel faces, said dies being adapted to be supported for reciprocal relative movement in a first direction between a first position in which said faces are spaced from each other and a second position in which said faces abut against each other, said dies having opposed, complementary, concave, partially cylindrical recesses in said faces thereof, said recesses mating with each other when said dies are in said second position to define a cylindrical cavity of precise cylindrical shape so that a sheet disposed within said recesses is bent into a precise cylindrical shape as said dies are moved from said first position to said second position, said faces having portions extending outwardly from the longitudinal edges of said reces-

ses, each said portion forming a sharp corner with the adjacent edge of its associated recess, said portions of said faces being offset from a first plane which includes the axis of said cylindrical cavity and which first plane is perpendicular to said first direction of relative reciprocal movement of said dies, said portions of said faces being offset from said first plane by a sufficient distance that the portions of said sheet that are bent last as said dies are moved from said first position to said second position contact diametrically opposite unbroken wall portions of said cavity which are vertically offset from said sharp corners, such that said sheet is bent into said cylindrical article without formation of outwardly projecting bulges on said cylindrical article at positions corresponding to said sharp corners.

4,355,530
PUNCHING MACHINE FOR MAKING DIFFERENT PRODUCTS AT THE SAME STEP

Ho L. Chen, 480, Chang Sui Rd., Sec. 2, Fu An Tsun, Shu Sui Hsiang, Chang Hua, Taiwan

Filed Dec. 2, 1980, Ser. No. 212,259
Int. Cl.³ B21J *9/18*
U.S. Cl. 72—452 **4 Claims**



1. A punching machine for making different products in the same cycle of operation comprising

a driven shaft;

an eccentric cam driven by said driven shaft;

a normally upright body having two lead plates,

a rear member with two sides united with said two lead plates, and

a bottom seat located at the bottom of said body and having a horizontal section;

a sliding member mounted for reciprocal vertical movement on said lead plates, said sliding member having a central part with a recess for receiving and being driven by said eccentric cam, said sliding member having a top part with a horizontal portion that is extended above said central part, and said sliding member having vertically aligned holes, an upper hole at the center of the bottom surface of said top part horizontal portion for retaining a top punch and a lower hole in the bottom surface of said sliding member for retaining a bottom punch;

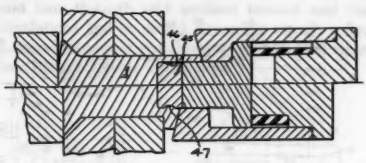
a first fixture for mounting a top punching-die and mounted at a central location in the top part of said machine body; and

a second fixture for mounting a bottom punching-die and mounted on said bottom seat.

4,355,531
RIVET FASTENER SYSTEM

Irwin E. Rosman, Woodland Hills, Calif., assignor to Hi-Shear Corporation, Torrance, Calif.

Division of Ser. No. 914,858, Jun. 12, 1979, Pat. No. 4,223,433, which is a division of Ser. No. 681,431, Apr. 29, 1976, Pat. No. 4,126,076, which is a division of Ser. No. 549,330, Feb. 12, 1975, Pat. No. 3,995,406, which is a continuation-in-part of Ser. No. 360,533, May 15, 1973, abandoned, and Ser. No. 480,760, Jun. 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 321,457, Jan. 5, 1973, abandoned. This application May 5, 1980, Ser. No. 146,604
Int. Cl.³ B21J *13/02*
U.S. Cl. 72—479 **3 Claims**



1. A tool having a central axis, for upsetting the tubular upsettable end portion of a rivet having a coincident central axis, a solid shank, said tubular upsettable portion having a free end, and within said free end, a recess with an inner circular wall within which there is disposed a core pin to engage said inner circular wall of said tubular upsettable end portion, said tool comprising a tool piece having an annular end face to exert an endwise compressive force on said free end of said upsettable end portion, an inner tool portion with a peripheral surface adapted to engage said inner circular wall so as to enter the tool, said inner tool portion also being adapted to exert an axial compressive force on said core pin, whereby an axial end load exerted by said tool piece on said free end causes said tubular upsettable portion to bulge and form an upset head, said free end being deflected inwardly toward said inner tool portion which limits the inward excursion of said free end, and yielding means axially interposed between the two tool portions, whereby the inner tool portion can exert force on the core pin only after the outer tool portion has at least partially formed the upset head.

4,355,532
APPARATUS FOR TESTING DAMPING FORCES OF SHOCK ABSORBERS

Jun-ichi Ikeda, Tokyo, and Yasuo Hasegawa, Sagamihara, both of Japan, assignors to Tokico Kabushiki Kaisha, Kanagawa, Japan

Filed Oct. 22, 1980, Ser. No. 199,518
Claims priority, application Japan, Oct. 23, 1979, 54-136843
Int. Cl.³ G01M *17/04*
U.S. Cl. 73—11 **5 Claims**

1. An apparatus for testing a shock absorber, wherein the shock absorber has first and second ends connected by a damping mechanism, and wherein the apparatus measures the damping forces of the damping mechanism during both the compression and extension strokes, the apparatus comprising:

a frame means for supporting the shock absorber;

first holding means for mounting the first end of the shock absorber on the frame means;

second holding means for mounting the second end of the shock absorber on the frame means;

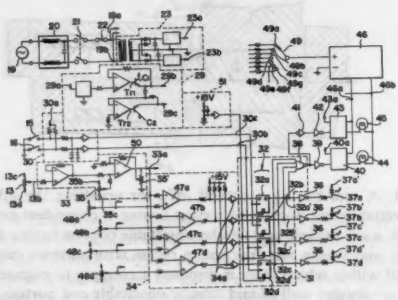
means for reciprocating the first holding means with respect to the second holding means to compress and extend the shock absorber, said reciprocating means including:

a rotor member mounted on the frame means, for rotating the rotor member and means attached between the rotor and the first holding means for converting the rotation of

the rotor member to reciprocating motion to thereby reciprocate the reciprocating means;

angular, position-sensing means juxtaposed between the rotor member and frame member for monitoring directly the angular position of the rotor member, said position-sensing means including means for generating a position signal indicative of the compression or extension of the shock absorber;

force detecting means attached to the second holding means for measuring the force imparted to the second holding means as the first holding means reciprocates with respect thereto, said force detecting means including analogue signal generating means for generating an analogue signal which is proportional to the force measured;



a monitoring circuit connected to both the position and analogue signal generator means for providing a periodic output signal during outer limits of the compression and extension strokes which output is indicative of the damping force at the outer limits of extension and compression;

reference circuit means for providing a reference signal indicative of desired levels of damping force at compression and extension of the shock absorber;

decision circuit means for comparing the output of the monitoring circuit with the reference signal, and

means for indicating when the output of the monitoring circuit is less than the reference signal to thereby indicate whether the damping forces are within acceptable limits.

4,355,533

GAS MEASUREMENT AND ANALYSIS SYSTEM

James F. Muldoon, Neptune, N.J., assignor to Electronic Associates, Inc., West Long Branch, N.J.

Continuation of Ser. No. 946,784, Sep. 28, 1978, Pat. No. 4,229,968. This application Aug. 6, 1980, Ser. No. 175,725

The portion of the term of this patent subsequent to Oct. 28, 1997, has been disclaimed.

Int. Cl.³ G01N *31/08*

U.S. Cl. 73—23.1 **12 Claims**

1. A system for on-line measurement and real-time analysis of a gas mixture from a gas source input comprising:

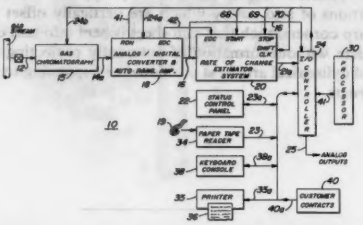
(a) gas chromatograph means for converting said mixture from said gas source input to a continuous, time-varying signal which is a function of the concentration of the constituent gases emanating serially from the output of said chromatograph,

(b) auto-ranging amplifier means for amplifying said time-varying signal over a dynamic voltage range,

(c) analog-to-digital converter means for sampling said amplified time-varying signal to convert said signal to digital form as a sampled data signal,

(d) on-line digital feedback means for providing an estimated rate of change of said sampled data signal, said feedback means including means for combining past time value signals with said sampled data signal for producing an area signal defined during a predetermined time period which area signal is proportional to the estimated rate of change signal thereby to perform differentiation and integration at the same time,

(e) continuous detector means coupled to said sampled data signal and said digital feedback means for determining the relative amount of each constituent gas of said gas mixture,



(f) on-line evaluation means responsive to said relative amount of each constituent gas and the time that said constituent gases emerged from said chromatograph for determining the correct chemical identity of each constituent gas of said gas mixture, and

(g) on-line determination means responsive to said chemical identity of each constituent gas for determining the correct overall heating value of said gas mixture.

4,355,534

DEVICE FOR DETECTING DEFECTIVE COMBUSTION IN AN INTERNAL COMBUSTION ENGINE

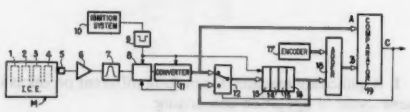
Raymond Roger, Versailles, France, assignor to Automobiles Peugeot and Automobiles Citroen, both of Paris, France

Filed Dec. 31, 1980, Ser. No. 221,570

Claims priority, application France, Jan. 7, 1980, 80 00191

Int. Cl.³ G01L *23/22*

U.S. Cl. 73—35 **4 Claims**



1. In a device for detecting combustion defects in an internal combustion engine comprising a detector for placing on the cylinder head of the engine and a system for utilising signals delivered by said detector and comprising means for temporarily storing in the course of each cycle data relating to each cylinder of the engine, and means for comparing the data relating to each cylinder, stored in succession in the course of a cycle, with corresponding data obtained in the course of the following cycle; the improvement wherein the utilisation system comprises means connected to the detector for converting analog data delivered by the detector into digital data and said temporary storing means comprise as many shifting registers connected in series as the engine has cylinders, said registers being connected to a switching circuit which is connected to an output of said comparing means so as to be controlled by the output signal of said comparing means, said switching means being capable of selectively connecting a first shifting register with an output of the converting means and with an output of a last shifting register, the last-mentioned output being furthermore connected to means for adding a threshold value and connected to said comparing means.

4,355,535

APPARATUS FOR AUTOMATICALLY MEASURING THE PROPERTIES OF AIR-PERMEABLE ROD-LIKE ARTICLES

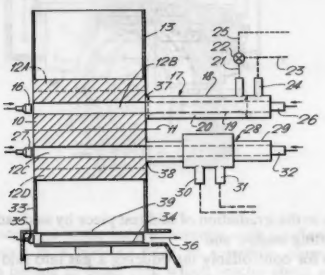
Roger Vaughan, Pill, England, assignor to Imperial Group Limited, Bedminster, England

Filed Oct. 15, 1980, Ser. No. 197,285

Claims priority, application United Kingdom, Oct. 19, 1979, 7936345

Int. Cl.³ G01M *3/26*

U.S. Cl. 73—37.8 **10 Claims**



1. An apparatus for automatically measuring a plurality of physical properties of air-permeable rod-like articles comprising:

(a) a plurality of measuring stations,

(b) an indexing drum arranged to receive an article and to rotate to present the article sequentially at each of the measuring stations,

(c) means for transferring the article from the drum to the measuring station at which it is presented,

(d) means at said measuring station to measure a respective physical property of the article,

(e) means for generating a signal indicative of the magnitude of the physical property measured at the measuring station,

(f) means for transferring the article from the measuring station back to the drum in readiness for being presented at the next measuring station, and

(g) means for measuring and recording said signals.

4,355,536

SLUDGE MEASURING APPARATUS AND ULTRASONIC PROBE ASSEMBLY THEREFOR

James L. McShane, Churchill Borough; Leonard R. Golick, Penn Township, Allegheny County, and Stanley R. Spiegelman, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 2, 1979, Ser. No. 80,976

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—633 **19 Claims**

1. Apparatus for ultrasonically measuring sludge accumulations between the tubes of a heat exchanger having a plurality of tubes straddling a central vertical aisle defined between vertical portions thereof, and contained within a vessel filled with water as a medium for propagating ultrasounds, comprising:

a probe carrier of elongated shape having rigidity in one plane and being bendable out of said plane;

an ultrasonic probe head mounted at one end of said probe carrier;

electrical conductors for said probe head carried by said probe carrier;

an elongated support adapted to be mounted horizontally within said aisle and on said vessel;

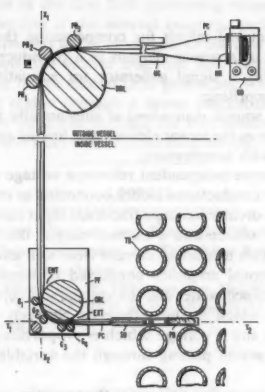
a carriage mounted for movement at successive positions along said elongated support;

guider means on said carriage defining in the horizontal plane an L-shaped path between an entry and an exit thereof;

said probe carrier being passed in said one plane and in a flexed condition across said entry and exit of said guider means into said L-shaped path;

means for feeding said probe carrier forward through said guider means in relation to one of said carriage positions and for extending said probe head horizontally into a lane defined at 90 degrees to said aisle between adjacent vertical portions of tube for said one carriage position;

said probe head being adapted to generate ultrasonic signals in said lane through said medium toward said sludge accumulations and to detect ultrasonic signals reflected back therefrom when positioned by said feeding means at a given distance inside said lane; and



means connected at the other end of said probe carrier and to said electrical conductors for deriving an indication of the depth of said sludge accumulations in relation to successive said carriage positions and under the operation of said feeding means for each corresponding lane.

19. An ultrasonic transducer assembly comprising:

a grounded metallic frame,

a piezoelectric element having a front and back electrode;

said back electrode being separated from said frame by an isolation spacer having a central opening;

an electrical lead connected to said back electrode through said central opening of said spacer and through said frame;

a peripheral insulation between said front and back electrodes at the periphery thereof;

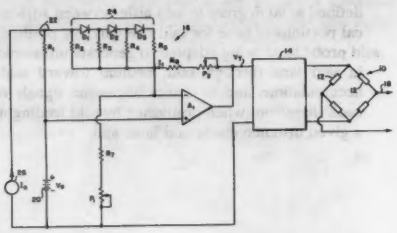
an electrical connection between said front electrode and said frame externally of said spacer and

said frame, spacer, peripheral insulation, electrical connection and front electrode being embedded altogether in an epoxy resin and said epoxy resin being machined to provide front and side faces for the overall assembly.

4,355,537
TEMPERATURE COMPENSATION FOR TRANSDUCER COMPONENTS

Leonard A. vander Have, Milford, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

PCT No. PCT/US80/01000, § 371 Date Nov. 6, 1980, § 102(e) Date Nov. 6, 1980, PCT Pub. No. WO82/00519, PCT Pub. Date Feb. 18, 1982
PCT Filed Aug. 4, 1980, Ser. No. 262,072
Int. Cl.³ G01L *19/04*
U.S. Cl. 73—708 8 Claims



1. An electrical circuit for compensating the temperature dependence of a sensor element in a transducer system, the system having a signal generator for activating the sensor element, comprising:

a current source maintained at substantially the same temperature as the sensor element and having an output that is linear with temperature;

a temperature-independent reference voltage source;

a variable conductance ladder connected as one branch of a Norton divider having a fractional input current from said current source and a current output that is piece-wise linear with increasing current from said current source;

an operational amplifier connected between the variable conductance ladder and the voltage source, and having an output which is the difference between the reference voltage and a voltage which is proportional to the fractional current passing through the variable conductance ladder;

whereby the output voltage of the amplifier varies inversely in accordance with the temperature dependent properties of the sensor.

4,355,538
EXO-ELECTRON NON-DESTRUCTIVE TEST DEVICE AND METHOD

Edward N. Hall, Rolling Hills Estates, Calif., assignor to Chromalloy American Corporation, St. Louis, Mo.

Filed Feb. 26, 1981, Ser. No. 238,478
Int. Cl.³ G01N *3/32*
U.S. Cl. 73—811 20 Claims

1. A non-destructive testing device comprising:

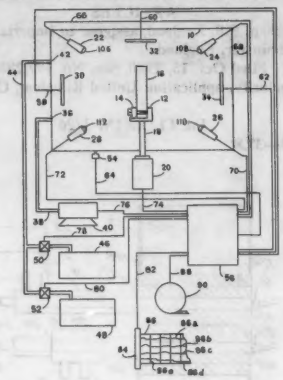
a test enclosure;

holding means in said enclosure including means for removably holding a test piece to be tested;

vibratable means connected to said holding means for vibrating said holding means and a test piece held thereby;

radiant energy emitting means in said enclosure for irradiating a test piece in said holding means;

measuring means in said enclosure for measuring electrons given off by a test piece held in said holding means responsive to the irradiation of said test piece by said radiant energy emitting means; and

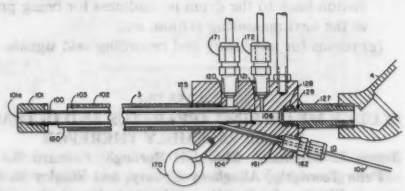


means for controllably introducing a gas into said enclosure.

4,355,539
FLUID SAMPLING PROBE

Klaus W. Schatz, Philadelphia, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 30, 1980, Ser. No. 221,483
Int. Cl.³ G01N *1/22*
U.S. Cl. 73—863.11 3 Claims



1. A probe for obtaining high temperature fluid samples comprising:

(a) a fluid sampling conduit through which the fluid samples pass,

(b) a sheath surrounding said fluid sampling conduit along a portion of its length to form an annulus between said fluid sampling conduit and said sheath,

(c) a supply of cooling fluid,

(d) a cooling fluid conduit for providing cooling fluid flow through said annulus to cool the fluid samples flowing through said fluid sampling conduit,

(e) a thermocouple having its sensing end located within said annulus to provide a signal representative of the temperature of said cooling fluid, and

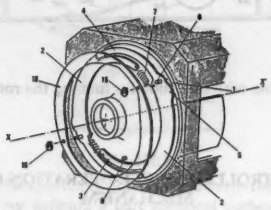
(f) means for deflecting the cooling fluid exiting from said annulus away from the sampling end of said fluid sampling conduit.

4,355,540

CENTRIFUGAL BRAKE FOR A GYROSCOPE WITH CARDAN SUSPENSION

Pierre A. Chombard, Boulogne, and Daniel Darni, Villeneuve St Georges, both of France, assignors to Societe Francaise d'Equipements pour la Navigation Arrienne, Velizy Villacoublay, France

Filed Jul. 3, 1980, Ser. No. 165,942
Claims priority, application France, Jul. 4, 1979, 79 17319
Int. Cl.³ G01C *19/26*
U.S. Cl. 74—5.1 3 Claims



1. A centrifugal brake for a gyroscope with Cardan suspension mounted in a housing fixed to a mobile support, said suspension having an outer ring which rotates about an external axis of the suspension, said brake comprising two identical weights mounted on one face of said outer ring, said weights being articulated on two diametrically opposed axes with respect to and parallel with said external axis of the suspension, each of said weights comprising a raised portion adapted to rub on a fixed part of said housing to thus exert a braking action on the assembly of the gyroscope and its suspension about said external axis, at least one return spring means interconnecting said weights, at least one stop limiting travel of said weights towards said external axis, said two weights comprising two inertial elements each of substantially "C" shape; each of said elements including a central portion and two end portions thinner measured radially than said central portion; one of said end portions on each of said weights comprising, with respect to said external axis, an outer end portion and the other of said end portions comprising an inner end portion; said at least one return spring means being fixed at one end to said central portion of one of said elements and at its other end to said radially inner end portion of the other of said elements; each of said elements being formed with a shoulder at the junction of its central portion and the radially inner end portion, and said shoulder of each element being in contact with said outer end portion of the companion element under the urging of said spring means.

4,355,541

MAGNETIC GYROSCOPE

Shigeo Okubo, Menlo Park, Calif., assignor to Design Professionals Financial Corp., Monterey, Calif.

Filed Sep. 22, 1980, Ser. No. 189,545
Int. Cl.³ G01C *19/28*
U.S. Cl. 74—5.6 E 14 Claims

1. A magnetic gyroscope comprising:

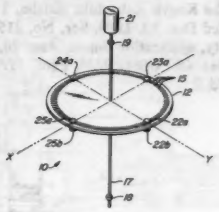
a member having an axis of rotation;

driving means for rotating the member about its axis of rotation;

a plurality of magnetic regions on the member; and at least one sensing means positioned in proximity to the member for detecting changes in the distance between at least one sensing means and each of the plurality of magnetic regions as each region passes the at least one sensing means, the at least one sensing means generating an output signal in relation to any change in said distance;

the at least one sensing means including a cylindrical housing for providing an internal magnetic path, electrically conductive cylindrical coil means within the housing, said coil means and said housing having a common axis of symmetry, and means for generating a magnetic field within the internal magnetic path through the coil means and in a region exterior to the housing, whereby variations in the strength of that portion of the field in the region exterior to the housing are sensed by the electrically conductive coil means;

the magnetic field generating means including first and second means for generating first and second opposing



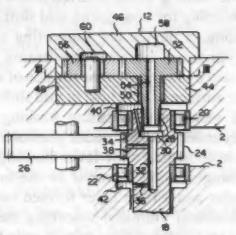
magnetic fields, the first magnetic field extending from the first pole of the first field generating means through an upper portion of the internal magnetic path through the coil means and to the other pole of the first field generating means, the second magnetic field extending from a first pole of the second field generating means along the exterior region through a lower portion of the internal magnetic path and through the coil means to the other pole of the second field generating means.

4,355,542

SCAVENGING PUMP

Yoshio Tsutsumi, Hirakata, and Tomoyuki Takahashi, Yawata, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Aug. 25, 1980, Ser. No. 180,893
Int. Cl.³ F16H *57/04;* F01M *9/00*
U.S. Cl. 74—467 2 Claims



1. A scavenging gear pump for use in a final drive including a casing for the final drive, the casing having formed therein a fluid reservoir for lubricant, and an input shaft rotatably supported through bearing means in said casing, said input shaft having formed therein a first fluid chamber leading to said bearing means, said scavenging gear pump comprising:

a housing detachably mounted on said casing, said housing having formed therein an inlet port and an outlet port of said pump and a second fluid chamber communicating with said outlet port, said inlet port being communicated with said fluid reservoir;

a drive gear rotatably mounted in said housing, said drive gear being coupled with said input shaft and having formed therein a fluid passage interconnecting said first and second fluid chambers; and

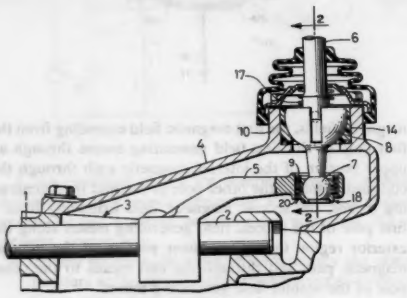
a driven gear rotatably mounted in said housing, said driven gear being in mesh with said drive gear.

4,355,543

DEVICE FOR SUPPORTING A SHIFT LEVER IN A MANUAL TRANSMISSION FOR AN AUTOMOBILE

Kazuhito Ikemoto; Nobuaki Katayama; Yukio Terakura, all of Toyota, and Kan Sasaki, Aichi, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Dec. 12, 1980, Ser. No. 215,702
Claims priority, application Japan, Aug. 20, 1980, 55-118555
Int. Cl.[3] G05G *9/18;* F16C *11/08*
U.S. Cl. 74—473 P 6 Claims



1. In combination with a manual transmission for an automobile including a shift lever having a large spherical portion and a small spherical portion provided in the lower end thereof, a shift lever retainer supporting said large spherical portion of said shift lever for shift-and-select operation, a resin bushing having a cylindrical outer surface spherically engaging with said small spherical portion of said shift lever and a shift lever housing fixed to an operation lever shaft extending toward said transmission, said bushing being inserted into a hole formed in said shift lever housing for connecting said shift lever with said shift lever housing, a device for supporting said shift lever comprising a cylindrical vibration preventing bushing interposed between said cylindrical outer surface of said resin bushing and the inner surface of said hole in said shift lever housing, said cylindrical vibration preventing bushing comprising a metallic outer cylinder inserted under pressure into said inner surface of said hole in said shift lever housing, a cylindrical vibration absorbing member secured to the inner surface of said outer cylinder and a resin layer formed on the inner surface of said cylindrical vibration absorbing member for slidingly contacting said outer surface of said resin bushing engaging with said small spherical portion of said shift lever, said resin layer having a low coefficient of friction.

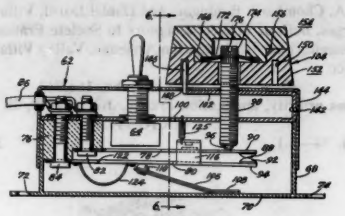
4,355,544

CONTROL KNOB WITH ROTATION LIMITER

Arnold R. Post, 133 Pelham Rd., Philadelphia, Pa. 19119

Division of Ser. No. 953,005, Oct. 20, 1978, Pat. No. 4,240,579. This application Aug. 25, 1980, Ser. No. 181,178
Int. Cl.[3] G05G *1/12, 5/04;* H01H *37/28*
U.S. Cl. 74—526 4 Claims

1. Apparatus for establishing a predetermined limit in the rotation of a manually rotatable control shaft comprising a manually operable knob, speed nut means, fixed with respect to said knob, and having an opening for receiving said shaft, said speed nut means securing said knob permanently to said shaft in fixed relationship, and means located underneath said knob



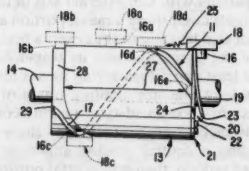
and engageable with said knob for limiting the rotation of said knob.

4,355,545

CONTROLLED SINGLE-OPERATION CAM MECHANISM

Roger J. Ross, Mont St-Gregoire, Canada, assignor to The Singer Company, Stamford, Conn.

Division of Ser. No. 150,254, May 15, 1980. This application Aug. 21, 1981, Ser. No. 295,040
Int. Cl.[3] F16H *53/02*
U.S. Cl. 74—567 3 Claims



1. A single operation cam arrangement comprising: a rotatable cam body; a cam follower; means shiftably supporting said cam follower for movement back and forth between a waiting position adjacent a first part of the cam body and an actuated position adjacent a remote part of the cam body; a cam surface extending along the cam body from an entrance portion at the remote part of the cam body to an exit end adjacent the first part of the cam body to engage and shift said cam follower to said waiting position adjacent said first part of the cam body when the cam follower is in its actuated position and the cam is rotated; a resilient trap attached to the cam body between said exit end of the cam surface and said waiting position of the cam follower adjacent said first part of the cam body, the trap being resiliently movable to allow the cam follower to be forced past the trap by pressure of the cam surface as the cam rotates; and means for shifting said cam follower independently of said cam surface from said waiting position adjacent said first part of said cam body to said actuated position adjacent said remote part of said cam body.

4,355,546

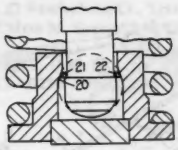
RECIPROCABLE PLUNGER FUEL INJECTION PUMP

Kieron J. Moloney, Cheltenham, and Gerald S. Thomas, Longlevens, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Jul. 3, 1980, Ser. No. 165,672
Claims priority, application United Kingdom, Aug. 9, 1979, 7927794
Int. Cl.[3] F16H *21/14*
U.S. Cl. 74—569 3 Claims

1. A reciprocable plunger fuel injection pump comprising a

pumping plunger reciprocable within a bore from which it extends, a spring abutment mounted about the outer end of the plunger, said spring abutment being of generally cylindrical form and having a flange for engagement by a spring, a stepped bore defined in the abutment and into which the outer end portion of the plunger extends, the outer end of the plunger being of part spherical form, a thrust member carried by the spring abutment for engagement with the outer end of the plunger, an inclined annular surface formed by the step in the



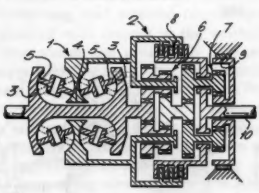
bore, said surface inclining outwardly towards the thrust member, and a ring defining a part spherical surface engageable with said inclined surface carried by the plunger, the portion of the spherical surface of the ring which engages with said inclined surface lying on the projected portion of a sphere of which the part spherical end of the plunger forms part, whereby the thrust member and spring abutment can rock relative to the plunger under the action of forces applied to the thrust member.

4,355,547

CONTINUOUSLY VARIABLE RATIO TRANSMISSION

Joseph J. Poole, Coventry, and Victor E. Strange, Solihull, both of England, assignors to BL Cars Limited, London, England

Filed May 30, 1979, Ser. No. 43,614
Int. Cl.³ F16H *15/08, 13/00, 3/74*
U.S. Cl. 74—690 **17 Claims**



1. A continuously variable ratio transmission of the rolling friction type including a plurality of tiltable rollers and a hydraulic circuit for controlling the tilt angle of said rollers, said control circuit comprising:

a source of pressurized fluid;

a valve means;

a sink for said fluid;

a pair of outlets from said valve means for conveying fluid to said sink;

a flow restriction means for restricting fluid flow from each of said outlets to said sink; and

means operative in response to pressure difference in the fluid in said outlets for providing a force to balance roller torque reaction;

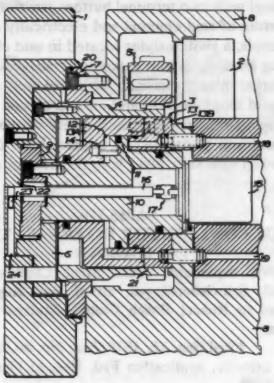
said valve means being arranged to have an actuating force which is proportional to said pressure difference, at least under steady state conditions.

4,355,548

TOOL TURRET

Rolf Svensson, and Ingemar Svensson, both of Västeras, Sweden, assignors to SMT Machine Company AB, Sweden

Filed Aug. 19, 1980, Ser. No. 179,394
Int. Cl.³ B23Q *17/00*
U.S. Cl. 74—826 **5 Claims**



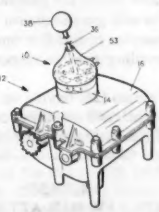
1. A tool turret comprising a turret head (1) which is displaceable between a rotational position and a working position, drive means (4, 5) adapted to rotate said turret head in said rotational position and being in constant engagement with the turret head, fixation means (6, 7) locking the turret head in said working position, and a transducer (15) sensing the position of the turret head which is rotatable with respect to a non-rotary body (10) axially displaceable with the turret head and having a circumferential projection (11) which serves as a piston and is received and axially displaceable in an annular recess (12) serving as a cylinder and being formed in a seat, receiving said body, of a member (13) supporting said body, said projection and said annular recess cooperating with each other to provide axial shifting of said body with the turret head between said rotational position and said working position, characterized in that said transducer (15) which is fixedly connected and axially displaceable with said body (10) is a pulse transducer adapted to sense the relative angular position between said body and said turret head.

4,355,549

SAFETY SWITCH FOR SMALL TRANSMISSION

Anton J. Reinhard, Fredericktown; and Hans Hauser, Chippewa Lake, both of Ohio, assignors to The J. B. Foote Foundry Co., Fredericktown, Ohio

Filed Nov. 8, 1979, Ser. No. 92,534
Int. Cl.³ B60K *41/06*
U.S. Cl. 74—850 **9 Claims**



1. A transmission including shift means having at least one gear-engaged position and a neutral position, said transmission

including a housing, said shift means comprising two adjacent shifter forks linearly moveable in parallel paths and a shift lever having a shift rod selectively engagable with either of said shifter forks, a terminal housing affixed to said transmission housing and having an opening through which said shift lever extends, said terminal housing having two terminals extending therefrom, said terminal housing forming an elongate channel with two terminal buttons positioned transversely in the bottom of said channel and electrically connected with said terminals, a switch slider located in said elongate channel and having an elongate slot extending transversely to the longitudinal extent of said channel, with said shift lever extending through said elongate slot, and an end of said slider having a conducting strip extending transversely across the lower surface thereof and positioned to contact both of said terminal buttons when said shift lever is in the neutral position.

4,355,550

TORQUE CONTROL FOR INTERNAL COMBUSTION ENGINES

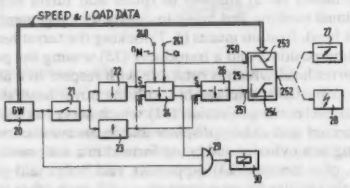
Gerhard Will, Steinheim; Walter Stroh, Cleebronn, and Martin Zechnall, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 28, 1979, Ser. No. 80,005

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1978, 2842389

Int. Cl.³ B60K *41/06*; F02D *5/00, 13/02*

U.S. Cl. 74—872 **11 Claims**



1. In a drive system having an internal combustion engine, an automatic transmission having an input coupled to said internal combustion engine and an output, and a load coupled to said output of said automatic transmission,

apparatus for controlling the torque of said internal combustion engine during shifting from a prevailing gear to a subsequent gear, comprising

means for generating a gear selection signal;

function generator means (25) having a first input (250) connected to said gear selection signal generator means for generating a control signal gradually changing the torque of said internal combustion engine as a predetermined function of time, and a second input;

first timing means (24) connected to said gear selection signal generator means for generating a first timing signal in response to said gear selection signal;

means (30) connected to said first timing means for disengaging said prevailing gear in response to said first timing signal; and

second timing means (26) having an input connected to said first timing means and an output connected to said second input of said function generator means.

4,355,551

CHAIN SAW BAR ATTACHMENT

Pete D. Kolleas, 10855 SW. Park St., Tigard, Oreg. 97223

Filed Jun. 30, 1980, Ser. No. 164,328

Int. Cl.³ B23D *63/16*

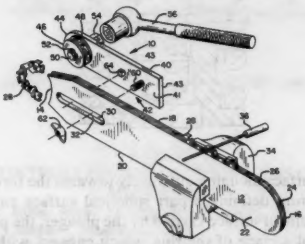
U.S. Cl. 76—78 R **5 Claims**

1. A chain saw bar attachment for a chain saw bar having a peripheral track for guiding a saw chain and which is detached from a chain saw comprising:

an elongated body;

mounting means for mounting said body to the connecting end portion of the bar with a free end portion of the body projecting outwardly from the connecting end; and

said body including a first elongated planar face which abuts one side surface of the chain saw bar and a free end which projects outwardly from the chain saw bar when the body is mounted, the free end of said body having a first peripheral edge of arcuate shape; and



a nonrotatable saw chain guiding member mounted to the free end of said body, said saw chain guiding member having a second peripheral edge of an arcuate shape which is positioned parallel to and spaced from the first peripheral edge so as to define an arcuate saw chain guide track therebetween which is generally in the plane of the track of the saw chain bar so as to guide saw chain carried by the bar from the track at one side edge of the bar, about the connecting end of the bar and to the track at the other side edge of the bar as the saw chain is sharpened.

4,355,552

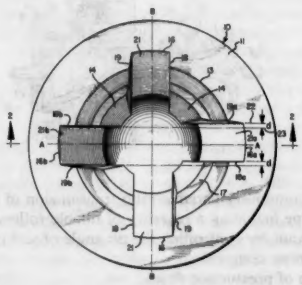
RECESSED HEAD SCREW

Charles E. Gutshall, Rockford, Ill., assignor to Technofast, Inc., Willowbrook, Ill.

Filed Apr. 14, 1980, Ser. No. 139,818

Int. Cl.³ F16B *23/00*

U.S. Cl. 81—460 **10 Claims**



1. A recessed head fastener having a recess including a central axially extending socket and a plurality of radially extending slots opening into said socket, each slot having a bottom surface of substantially uniform width interconnecting two opposed sidewalls;

said slots being arranged in diametrically opposite pairs, the slots in each pair being symmetrically offset in opposite directions with respect to a plane including the axis of the fastener,

the offset distance between diametrically opposite pairs of said slots being within the range of 0.005 to 0.0085 inches

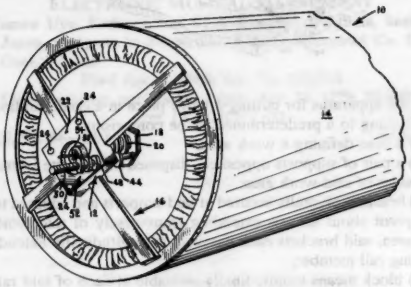
and sufficiently small to permit the insertion into said recess of a driver having a plurality of radial flutes corresponding in number with said slots, said flutes being symmetrically spaced about the axis of said driver,

insertion of said driver causing deflection of said flutes into frictional engagement with the walls of said slots, said engagement being sufficient to provide a cling fit of said fastener to said driver.

4,355,553
PORTABLE TURNING TOOL

Fredrick Z. Church, 27 Vandenberg Ct., Travis Air Force Base, Calif. 94535, and Calvin M. Swesey, 149 Glasgow Way, Vacaville, Calif. 95688

Filed Sep. 9, 1980, Ser. No. 185,470
Int. Cl.³ B23B *5/00*; B24B *19/00*
U.S. Cl. 82—4 R **10 Claims**



1. A portable turning tool for removing material from a workpiece mounted for rotation within a rigid member, said tool comprising an elongated element, means adjustably mounted at one end of said elongated element for removing material from the workpiece positioned in contact therewith, means mounted upon said elongated element proximate said one end of said elongated element for slidably but nonrotatably supporting said elongated element with respect to the workpiece thereby positioning said material removing means in a predetermined position with respect to the workpiece, means on said supporting means for removably and nonrotatably securing said supporting means to the rigid member, means mounted upon said elongated element proximate the other end of said elongated element for moving said elongated element with respect to said supporting means, and means mounted upon said elongated element interposed between said moving means and said supporting means for spacing said moving means from said supporting means and permitting said elongated element to move with respect thereto whereby upon simultaneous rotation of the workpiece adjacent said material removing means and movement of said elongated element with respect to the workpiece, a preselected amount of material can be removed from the workpiece.

4,355,554
WEB SECTIONING APPARATUS INCLUDING AN INTERFERENCE INDICATOR

Joseph L. Gregory, III, Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Oct. 10, 1980, Ser. No. 195,759
Int. Cl.³ B26D *1/40, 7/26*
U.S. Cl. 83—37 **20 Claims**

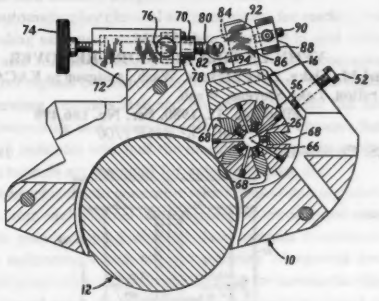
1. Web sectioning apparatus comprising:

a rotatable drum;

a rotatable knife assembly, said knife assembly including a cutting edge repetitively engagable with said drum upon rotation of said knife assembly and said drum, whereby a web carried by said drum may be sectioned during each such engagement;

indicator means responsive to the engagement of said cutting edge and said drum for providing an indication of the force resulting from said engagement, said indicator means including:

a force sensor for providing a signal indicative of said engagement force; and

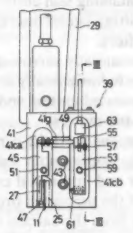


processing and display means responsive to said signal for providing an observable display, said processing and display means including first and second comparators responsive to said signal and to first and second predetermined signals respectively indicative of first and second preselected engagement forces, and first, second and third lamps responsive to said first and second comparators.

4,355,555
BANDSAW BLADE DEVIATION DETECTING APPARATUS FOR HORIZONTAL BANDSAW MACHINES

Morimasa Kobayashi, Isehara, and Nobuo Sakurai, Yokohama, both of Japan, assignors to Amada Company, Limited, Tokyo, Japan

Filed Sep. 24, 1980, Ser. No. 190,236
Claims priority, application Japan, Sep. 25, 1979, 54-122021
Int. Cl.³ B23D *53/00, 55/00, 59/00*
U.S. Cl. 83—62.1 **6 Claims**



1. A bandsaw blade deviation detecting apparatus for a bandsaw machine, said apparatus detecting the lateral deviations of a bandsaw blade which is guided by a pair of guide assemblies disposed along the line of cut, said apparatus comprising detecting means for detecting lateral division of the bandsaw blade, means for transforming the detected deviation signals into signals related to the span between the guide assemblies and the lateral deviation of the bandsaw blade from the line of cut, means for previously setting positive and negative allowable limits of the deviations of the bandsaw blade from the line of cut, comparing means for comparing said

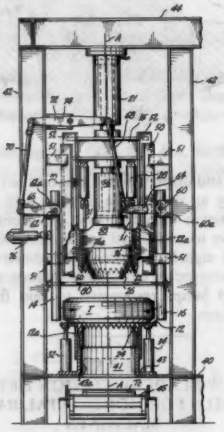
detected deviation and said previously set allowable limits and for generating a stop signal representative of deviation outside said allowable limits, and a control circuit for stopping the bandsaw machine when said stop signal is generated by said comparing means.

4,355,556

VEHICLE TIRE RIM CORE REMOVER

Carl M. Ulsky, Lake Stevens, Wash., assignor to KACA Corporation, Lake Stevens, Wash.

Filed Sep. 12, 1980, Ser. No. 186,498
Int. Cl.³ B26F *1/00*
U.S. Cl. 83—124 **19 Claims**



1. Apparatus for cutting the reinforcing rim cores out of used automotive tires and the like comprising:

coaxially vertically aligned, cooperably formed upper and lower annular cutters having matched cutting edges extending substantially around their respective mutually adjacent inside peripheries,

carrier means maintaining said cutters normally separated by a distance permitting lateral insertion and removal of a tire between the cutters,

support means substantially surrounding the lower cutter for supporting a tire in horizontally disposed position inserted between the separated cutters and substantially in coaxial alignment with the cutters,

carrier actuator means for said carrier means operable to move at least the upper cutter axially downward toward the lower cutter and into initial cutting engagement with the upper side of the supported tire for initiating severance of the rim cores from the carcass of such tire and thereafter to effect relative closure of the cutters substantially to sever the tire walls between the cutters,

tire-engaging axially movable stripper means within the upper cutter and extending closely alongside its cutting edge,

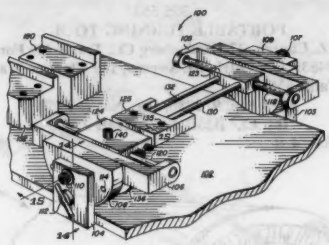
and stripper actuator means operable upon such relative closure of the cutters to press the stripper means downwardly against the upper rim core and force the rim cores downwardly into the interior of the lower cutter and in the process thereof complete the severance by shearing action on the tire walls along the lower cutter's cutting edge.

4,355,557

APPARATUS FOR SAWING A WOOD PIECE IN CONFORMANCE WITH A TEMPLATE CONFIGURATION

Michael A. Mecsey, 2323 S. Butte Ave., Tempe, Ariz. 85282

Continuation-in-part of Ser. No. 947,354, Oct. 2, 1978, abandoned. This application Dec. 3, 1979, Ser. No. 99,603
Int. Cl.³ B27B *11/04*
U.S. Cl. 83—565 **4 Claims**



1. An apparatus for cutting a work piece in a configuration conforming to a predetermined shape comprising:

(a) a base defining a work area;

(b) a pair of supports oppositely disposed at opposite lateral sides of said work area;

(c) brackets pivotally secured at said supports and adapted to pivot about an axis extending transversely of said work area, said brackets each carrying a longitudinally extending rail member;

(d) block means longitudinally slideable at each of said rail members having rod means extending transversely across said work area therebetween;

(e) table means transversely slideable along said rod means adapted to receive a cutting member having a depending blade and a depending follower means; and

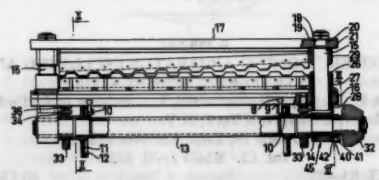
(f) work piece holder means disposed at either longitudinal side of said work area and template holder means disposed at either longitudinal side of said work area, said template holder means adapted to detachably secure a template thereto whereby movement of the follower means along said template is translated to corresponding motion to said blade at the work area whereby said entire table and attached blade member can be rotated about a transverse axis for imparting angular cuts.

4,355,558

SHEARS FOR SHEET METAL CUTTING

Leo Hofer, Pitea, Sweden, assignor to Nordtool AB, Ojebyn, Sweden

Filed Jun. 11, 1980, Ser. No. 158,637
Claims priority, application Sweden, Jun. 21, 1979, 7905344
Int. Cl.³ B26D *5/10, 5/16*
U.S. Cl. 83—587 **10 Claims**



1. Shearing apparatus for shearing sheet material comprising: a horizontal stand; a lower stationary shearing blade rigidly attached to the stand; an upper shearing blade movable

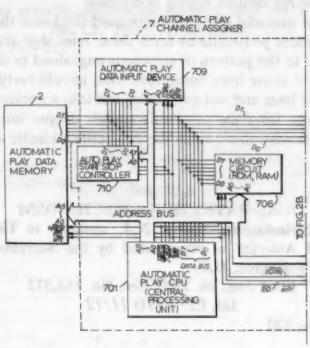
downwardly relative to the lower shearing blade to effect a shearing action; and a drive mechanism for supporting the movable blade and for raising and lowering the movable blade relative to the stationary blade, said drive mechanism including a horizontal shaft, mounting means vertically movable with respect to said stand and connected to said movable blade, said mounting means mounting said shaft for rotation about its axis and for vertical movement with said mounting means, means rotatable with said shaft for cooperating with said stand upon rotation of said shaft in one direction from a starting position to move said shaft, said mounting means and said movable blade downwardly relative to said stand whereby the weight of the movable blade and said drive mechanism is supported by said stand and whereby the dead weight of said drive mechanism and said movable blade is utilized by gravity action during downward shearing movement of the movable blade.

4,355,559

ELECTRONIC MUSICAL INSTRUMENT

Masaru Uya, Kadoma, and Kinji Kawamoto, Yahata, both of Japan, assignors to Matsushita Electric Industrial Co. Ltd., Osaka, Japan

Filed Apr. 9, 1980, Ser. No. 138,516
Claims priority, application Japan, Apr. 12, 1979, 54-44919
Int. Cl.³ G10F 1/00
U.S. Cl. 84—1.03 **4 Claims**



1. An electronic musical instrument having a plurality of musical tone signal generating channels for generating tones and comprising:

an automatic play means having a memory for controlling the tone generation of said plurality of musical tone signal generating channels on the basis of automatic play data recorded in said memory so as to successively and automatically generate musical tones;

a manual play means having a keyboard and other manual performance controls for controlling the tone generation of said plurality of musical tone signal generating channels in response to said keyboard and other manual performance controls so as to generate musical tones;

wherein the tone generation by said plurality of musical tone signal generating channels is jointly controlled by said automatic play means and manual play means;

further having means wherein each of said musical tone signal generating channels are arranged so as to be controlled by either said automatic play means or by said manual play means so as to enable tone generation;

and further comprising a channel-use assigning means for assigning at least part of said musical tone signal generating channels previously specifically assigned for control by said automatic play means, so as to change them over to control by said manual play means;

and further comprising a channel assigner means which, along with having means for controlling the tone generation, based on said automatic play data, of the musical tone signal generating channels assigned for automatic play use by said automatic play means and controlled by said channel-use assigning means, also has means which enable the control of tone generation, based on play data generated by said manual play means, of the musical tone signal generating channels assigned for manual play use and controlled by said channel-use assigning means;

wherein said channel assigner means comprises:

(a) an automatic play channel assigner means for reading and decoding said automatic play data recorded in said memory and for outputting pitch data and tone generation control signals corresponding to said musical tone signal generating channels assigned for automatic play use and for outputting said automatic play assigning channel data which indicates which of the musical tone signal generating channels are assigned for automatic play use;

(b) a channel-use data generator which, based on assignment data from said channel-use assigning means and said automatic play assigning channel data, outputs channel-use data indicating which of said plurality of musical tone signal generating channels can be used for automatic play;

(c) a manual play channel assigner means which, based on said play data of said manual play means, outputs tone generation control signals and pitch data which is assigned to said plurality of tone signal generating channels other than those tone signal generating channels indicated as being for automatic play by said channel-use data; and

(d) a data supplier means which receives said pitch data and tone generation control signals outputted from said automatic play channel assigner means and said pitch data and tone generation control signals outputted from said manual play channel assigner means, and then, in accordance with said channel-use data, matches said pitch data and tone generation control signals outputted in accordance with said plurality of musical tone signal generating channels used for automatic play from said automatic play channel assigner means and supplies them to respective musical tone signal generating channels and matches said pitch data and tone generation control signals outputted in accordance with said plurality of musical tone signal generating channels used for manual play from said manual play channel assigner means and supplies them to respective musical tone signal generating channels;

and wherein said automatic play channel assigner means comprises:

(a) an automatic play CPU means, including a data bus and automatic play data memory, for executing programmed commands for automatic play processing and for storing automatic play data and automatic play assignment channel data and pitch data and for generating tone generation control signals;

(b) an automatic play data readout means which is connected to said data bus of said automatic play CPU means and reads automatic play data from said automatic play data memory of said CPU means;

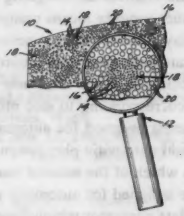
(c) a latching means for storing automatic play assignment channel data which is connected to said data bus and latches automatic assignment channel data from said data bus; and

(d) an additional latching means for storing automatic play assignment data which is connected to said data bus and latches pitch data and tone generation control signals for automatic play from said data bus and assigned to said plurality of musical tone signal generating channels.

4,355,560
REED CONSTRUCTION

David W. Shaffer, 1214 Borden Rd., San Marcos, Calif. 92026

Continuation of Ser. No. 47,744, Jun. 12, 1979, abandoned. This application Sep. 16, 1980, Ser. No. 187,634
Int. Cl.³ G10D 9/02
U.S. Cl. 84—383 A 19 Claims



1. A reed for a musical instrument, said reed having a longitudinal axis and comprising:

a plurality of fiber means oriented substantially longitudinally of said reed and arranged in generally uniformly spaced-apart relationship cross-sectionally of said reed;

binding means combined with said fiber means for securing same, said fiber means having a modulus of elasticity that is greater than that of said binding means; and

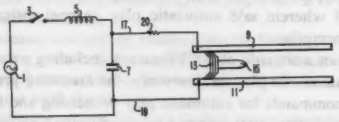
filler means substantially uniformly dispersed in said binding means in regions between said fiber means, said filler means having a density less than the density of the binding means;

said fiber means, binding means and filler means having relative proportions selected to produce an acoustic impedance of said reed at least comparable to the acoustic impedance of natural cane.

4,355,561
PROJECTILE LAUNCHING SYSTEM WITH ASSURED CURRENT DIVISION

George A. Kemeny, Wilkins Township, Allegheny County, Pa., and John P. Barber, Kettering, Ohio, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 10, 1980, Ser. No. 185,705
Int. Cl.³ F41F 1/00
U.S. Cl. 89—8 12 Claims



1. An electromagnetic projectile launching system comprising:

a pair of conductive rails;

means for conducting current between said rails and for propelling a projectile from one end of said rails to another;

a source of high current;

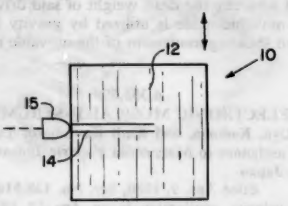
means for commutating current from said current source to said rails connected to said rails in parallel with said means for conducting current and said means for propelling the projectile; and

a resistance electrically connected between said current conducting and projectile propelling means and said means for commutating current for limiting the flow of current to said rails prior to the commutation of current to said rails and for carrying the full current during the entire launch.

4,355,562
ARMOR

Robert G. S. Sewell; John K. Pringle; Marvin E. Backman, all of Ridgecrest, and Stephen A. Finnegan, China Lake, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 12, 1980, Ser. No. 129,046
Int. Cl.³ F41H 5/00
U.S. Cl. 89—36 A 4 Claims



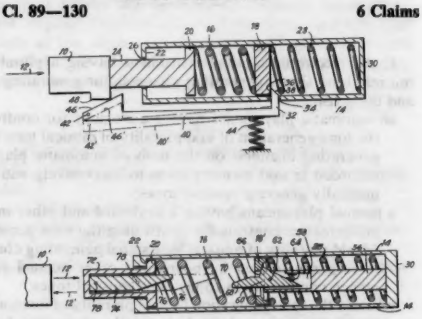
1. Lightweight armor plating for protecting vital installations or control centers which comprises:

travertine material of a predetermined thickness that causes an incident projectile to form shear lines that are perpendicular to the pattern of striations engrained in said material, said shear lines being restricted to relatively narrow, parallel lines and not expanding out into a conical form as the force from the projectile travels deeper into said armor, thereby dissipating the projectile's kinetic energy.

4,355,563
DUAL RATE FIRING MECHANISM

Henry P. Swieskowski, Sparta, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 26, 1980, Ser. No. 163,372
Int. Cl.³ F41D 11/12
U.S. Cl. 89—130 6 Claims



1. A dual-rate firing mechanism for an automatic weapon of the type having a bolt driven in a recoil action and returned in a counter recoil action, comprising:

means for storing energy of said bolt during said recoil action and for returning at least part of the stored energy to said bolt during said counter recoil action,

said means for storing energy including a recoil spring having first and second ends and a spring constant, means for applying kinetic energy of said bolt to said first end, and means for holding said second end stationary whereby

said kinetic energy is transformed into spring potential energy in said recoil spring,

said means for holding said second end stationary including a mass in abutment with said second end and a sear effective to substantially latch said mass against displacement while said kinetic energy is being transformed,

means for selectively dissipating a portion of the stored energy during said said recoil action whereby less than substantially all of said stored energy remains for return to said bolt during said counter recoil action,

said means for selectively dissipating including a positioning spring having a second spring constant effective to urge said mass in a direction opposite to the direction of applying said kinetic energy to said recoil spring, and means for releasing said mass from latching by said sear after a predetermined amount of said kinetic energy is transformed in said recoil spring whereby a portion of the stored kinetic energy is dissipated in moving said mass against said positioning spring.

4,355,564

PNEUMATIC RECIPROCATING MECHANISM

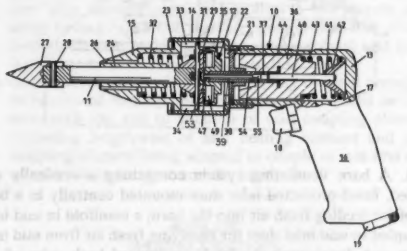
Per L. A. Gidlund, Täby, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Mar. 28, 1980, Ser. No. 134,761

Claims priority, application Sweden, Mar. 30, 1979, 7902873

Int. Cl.³ F01B *15/02*; F01L *21/02*

U.S. Cl. 91—217 **8 Claims**



1. In a pneumatic impact mechanism, comprising a working member **(11)** reciprocably guided in a housing **(10)** and balanced between a spring **(32)** and a pressure air supplied working chamber **(49)**; the working chamber **(49)** being defined by a rear end portion **(29)** of the working member **(11)**, a reaction support member **(12)** and an elastic seal element **(47)** located between the working member **(11)** and the reaction support member **(12)**,

the improvement wherein:

the seal element **(47)** comprises an annular axially extending valve collar **(48)** which is radially expandible by the air pressure in the working chamber **(49)** to an outer diameter exceeding its nominal outer diameter; and

the reaction support member **(12)** comprises a depression **(51)** located coaxially with said radially expandible valve collar **(48)**, said depression **(51)** having an inner peripheral wall **(52)** conically diverging in the working stroke direction of said working member **(11)**, and having at its forward end facing the seal element **(47)** a diameter exceeding the nominal diameter of said radially expandible valve collar **(48)**;

said radially expandible valve collar **(48)** during each reciprocation cycle of the working member **(11)** entering said depression **(51)** and by radial expansion therein establishing an air tight seal with said peripheral wall **(52)** of said depression **(51)**.

4,355,565

FLUID CIRCUIT WITH ZERO LEAK LOAD CHECK AND BY-PASS VALVE

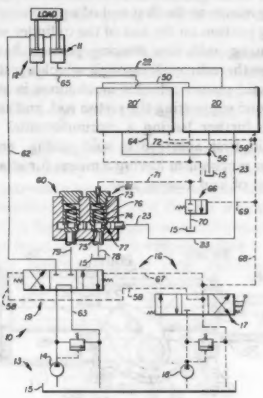
Donald L. Bianchetta, Coal City, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US80/00321, § 371 Date Mar. 24, 1980, § 102(e) Date Mar. 24, 1980, PCT Pub. No. WO81/02768, PCT Pub. Date Oct. 1, 1981

PCT Filed Mar. 24, 1980, Ser. No. 206,192

Int. Cl.³ F15B *11/16*

U.S. Cl. 91—518 **3 Claims**



1. In a fluid circuit **(10)** having a pair of extensible and retractable fluid cylinders **(11,12)**, load check valve means **(20,20')** for communicating fluid pressure to each of said cylinders to extend or retract the same, and control means **(47)** for interconnecting said load check valve means to permit gradual retraction of said cylinders upon loss of fluid pressure between said load check valve means, the improvement comprising, said control means including resolver valve means **(47')** for movement between first and second positions and (1) for moving to said first position to equalize the fluid pressures in said cylinders upon retraction of said cylinders and when the level of fluid pressure in one of said cylinders exceeds the level of fluid pressure in the other one of said cylinders, and (2) for moving to said second position gradually reducing the level of fluid pressure in said cylinders upon loss of fluid pressure between said load check valve means.

4,355,566

VALVE DRIVING APPARATUS

Shoichi Kaji, Yamanashi, Japan, assignor to Kitazawa Valve Co., Ltd., Tokyo, Japan

Filed Jan. 3, 1980, Ser. No. 109,404

Claims priority, application Japan, Jun. 8, 1979, 54-78107[U]; Jun. 8, 1979, 54-78109[U]

Int. Cl.³ F15B *15/24*; F01B *29/04, 9/00*

U.S. Cl. 92—13.6 **3 Claims**

1. A valve driving apparatus comprising:

a casing having a first bearing portion receiving aperture at a first end thereof and a second bearing portion receiving aperture at a second end thereof and aligned with said first bearing portion receiving aperture along an axis;

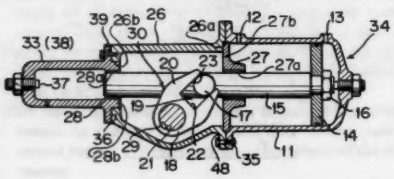
a valve driving shaft extending through said casing transverse to and offset from said axis;

a movement conversion-transmission mechanism connected to said valve driving shaft;

a plurality of rods interchangably positionable in said casing along said axis and through said apertures and being connectable to said movement conversion-transmission mechanism, and each having a first end projecting through said

first bearing portion receiving aperture and a second end projecting through said second bearing portion receiving aperture, each piston rod having a piston attaching means at the first end thereof and one piston rod having the second end free of any attaching means and a second piston rod having the second end with plate attaching means thereon;

a plurality of different size piston-cylinder mechanisms interchangably attachable to said first end of said casing, each piston-cylinder mechanism having (1) a cylinder with ports for the inlet and outlet of pressure fluid, (2) a piston slidable in said cylinder and attachable by the piston attaching means to the first end of a piston rod, and (3) a first bearing portion on the end of the cylinder which is toward said casing, said first bearing portion having a bearing aperture therethrough through which a piston rod extends when said piston-cylinder mechanism is attached to said casing and supporting the piston rod, and said first bearing portion further having a circumferential portion fitting into said first aperture in said casing, and each piston cylinder mechanism having a means for attaching it to said first end of said casing; and



a plurality of piston rod movement control means interchangably attachable to said second end of said casing, each having (1) a housing with a bearing portion constituting an end plate with a projection thereon of a size for being matingly receiving in said second bearing portion receiving aperture in said casing, said bearing portion having a bearing aperture therethrough through which a piston rod extends when said piston rod movement control means is attached to said casing and supporting the piston rod, and (2) means for attaching said piston rod movement control means to said second end of said casing, one of said piston rod movement control means having a stop at the end thereof remote from the end plate thereof and the interior of said housing receiving only the piston rod and being traversed thereby and the housing being attached to said second end of said casing when the one piston rod is positioned in said casing, and a second of said piston rod movement control means having a stop at the end thereof remote from the end plate and a spring holder slidable in said housing and being attached to the second end of said second piston rod when said second piston rod is positioned in said casing and also having a spring in said housing between said spring holder and the end of the housing at which said stop is positioned.

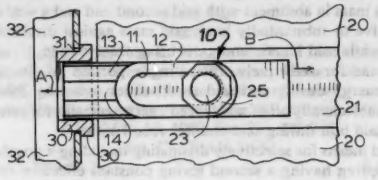
4,355,567

PIVOTED BLADE DAMPER AND PIN

Louis Josephson, Yonkers, N.Y., assignor to American Hardware & Paint Co., Inc., Elizabeth, N.J.

Filed Feb. 28, 1980, Ser. No. 125,675
Int. Cl.³ F24F *13/14*
U.S. Cl. 98—121 A **6 Claims**

1. In combination a pivoted blade having a mounting pin comprising a cylindrical shaft having a centrally positioned hole extending therethrough, said hole being surrounded on one side of the pin with an upstanding flat seat, and said hole being longer than it is wide so that it extends longitudinally of the pin, said mounting pin being mounted at a side margin of said blade in a pin-receiving depression in said blade by means of a bolt extending through a hole in said blade and through the



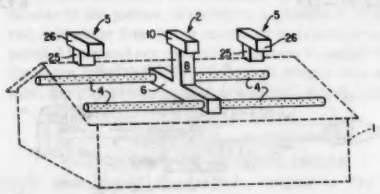
longitudinally extending hole in said pin, and a nut associated with said bolt, said nut locking against the flat seat of said pin.

4,355,568

LIVESTOCK BARN VENTILATION SYSTEM

Dale Steckley, R.R. #2, Carstairs, Alberta, Canada (T0M 0N0)

Filed Dec. 4, 1980, Ser. No. 213,192
Claims priority, application Canada, Dec. 5, 1979, 341263
Int. Cl.³ F24F *7/06*
U.S. Cl. 98—33 A **1 Claim**



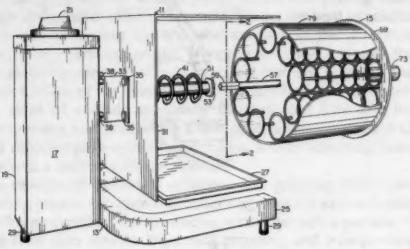
1. A barn ventilating system comprising a vertically oriented, hood-protected inlet duct mounted centrally in a barn roof for feeding fresh air into the barn; a manifold in said barn coupled to said inlet duct for receiving fresh air from said inlet duct and distributing the fresh air toward both sides of the barn; elongated distribution ducts comprising plastic tubes connected to openings in the outer free ends of said manifold and extending normally to said manifold and in opposite directions therefrom for receiving air from the inlet duct and distributing the air along substantially the entire length of the barn; elongate supports extending along the upper surface of, and connected to, said plastic tubes for supporting said tubes from the barn roof; fan means in said manifold for drawing fresh air into the inlet duct and hence into the manifold, and for feeding the air into said distribution ducts, said fan means being located adjacent the outer free ends of said manifold generally in said openings and aligned with the connected ends of respective ones of said distribution ducts, and said manifold having removable access closures at its outer free ends for permitting ready access to said fans; recirculation openings in said vertical duct between said manifold and the barn roof, and hence lying upstream of said fan means, controllable hinged doors mounted on said inlet duct for selectively varying the open or closed state of said recirculation openings, and hence the ratio of outside air to inside air passed to said manifold and hence to said fan means; openings in said distribution ducts for discharging air into the barn along substantially the entire lengths thereof; at least one hood-protected outlet located generally at the uppermost point of the roof of the barn remote from said inlet duct for discharging air from the barn; and a pressure responsive closure member in said outlet.

4,355,569

ROTARY HOT DOG COOKER

Thomas L. Sage, 21319 Castillo St., Woodland Hills, Calif. 91364

Filed Nov. 24, 1980, Ser. No. 209,549
Int. Cl.³ A47J 43/18
U.S. Cl. 99—427 8 Claims



1. Cooking apparatus comprising

a base,

an elongated heating element,

means for supporting said element in a horizontal position above said base,

a carrier unit adapted to extend lengthwise of said heating element and having a central rod with first and second ends and a plurality of hot dog holders in the form of elongated hollow cages rigidly supported from the second end of said rod in a circular array with axes of said cages parallel to said rod, said cages having a transverse dimension large enough to permit hot dogs to roll therein, said array having an internal diameter greater than that of said heating element and being adapted to surround said heating element when in operating position, and

a motor driven rotator having a coupling element arranged to be rotated thereby, said rotator being mounted on said base with the axis of rotation of said coupling element extending lengthwise of said heating element and said coupling element being adapted to couple to said first end of said rod to rotate it and the carrier unit.

4,355,570

BARBECUE OVEN

Edward W. Martin; Kenneth R. Meyers, and Fred E. Tucker, III, all of Dallas, Tex., assignors to Fred B. Bearden, Jr., Richardson, Tex.

Continuation-in-part of Ser. No. 892,398, Mar. 31, 1978, Pat. No. 4,307,659. This application Aug. 5, 1980, Ser. No. 175,578
Int. Cl.³ A47J 27/00
U.S. Cl. 99—446 1 Claim

1. A barbecue oven for cooking and smoking food comprising:

a main body portion defining a cooking area and having a front opening;

a door assembly hingably mounted to said main body portion for closing said front opening;

said door assembly comprising a main door section, a door inset extending inwardly into said cooking area, hinge means for hingably mounting said door assembly to said main body portion, latch means for securing said door assembly closing said front opening, seal means interposed between said main door section and the periphery of said main body portion about the front opening to form an airtight seal therebetween and door grease deflectors extending inwardly and downwardly from a lower portion of said main door section between said door inset and said seal means, said door inset and said door grease deflectors deflecting grease and moisture deposited on and flowing down the inner surface of said main door section and said door inset and causing said grease and moisture to drip onto the bottom interior surface of said main body portion;

said bottom interior surface including a kick-up portion angled upwardly adjacent the door assembly of the oven and being disposed beneath said door assembly for containing grease and moisture on the bottom interior surface within the oven;

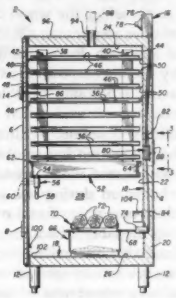
racks supports mounted on two interior sidewalls of said oven;

a plurality of substantially planar cooking racks for supporting the food during cooking, said racks being slidably mounted within said cooking area on said rack supports in a horizontal position, said racks being mounted in vertically spaced apart horizontal planes;

a drip pan supported below said cooking racks for catching grease and moisture dropping from the food during cooking;

side grease deflectors disposed below said cooking racks and above said drip pan and extending inwardly from said oven main body portion to deflect grease and moisture droppings from the food during cooking into said drip pan;

the lowermost rack support comprising two parallel flanges disposed horizontally along the interior sidewalls of the oven and extending away from said interior sidewalls in an inward direction, each of said flanges including a back raised portion for directing grease and moisture droppings toward the front of the oven and including a front raised portion for directing grease and moisture drippings toward the rear of the oven;



an aperture disposed in said drip pan for draining grease and moisture from said drip pan;

a valve mounted on said drip pan to control the flow of grease and moisture through said aperture;

a lever handle extending from said valve for opening and closing said valve to selectively allow grease and moisture to flow through said aperture, said handle being positioned to engage the door assembly of the oven to prevent the door assembly from being closed when said valve is in an open position;

an electrical heating element disposed within said cooking area for providing heat;

an electrical receptacle connected to said electrical heating element for providing electrical current to said electrical heating element;

a grease shroud disposed above said electrical receptacle for preventing grease and moisture from dripping onto said electrical receptacle;

a heater support for supporting said heating element a predetermined distance above the bottom of said oven, said heater support comprising a substantially horizontal top surface, substantially vertical sidewalls extending downwardly from two edges of said top surface, substantially horizontal ledge portions extending inwardly from the lower edge of said vertical sidewalls, substantially vertical spacer portions extending downwardly from the inner edge of said horizontal ledge portions and substantially

horizontal flange portions extending outwardly from the lower edge of said vertical spacer portions, said top surface, vertical sidewalls and horizontal ledge portions cooperating to enclose and support said electrical heating element, said vertical spacer portions acting to separate said heating element a predetermined distance from the bottom of said oven and said horizontal flange portions forming means for attaching said heater support to said oven;

the heat generated by said heating element being confined within said heater support so that air beneath said top surface is maintained at a relatively higher temperature than the surrounding air within the cooking area to enhance the convection of the heated air from beneath said top surface to provide even heating throughout the cooking area;

said top surface and said vertical sidewalls having a plurality of apertures formed therein permitting circulation of air about the heating element, said apertures being positioned to prevent grease and moisture from dropping on said heating element;

a wood tray positiioned on said top surface and guided thereon by pin means on said top surface, said wood tray containing wood for smoking said food and comprising a wood container and a cover, the temperature of the heated air beneath said top surface being sufficient to cause heat conduction through said top surface and said wood tray to smoulder the wood therein;

said wood container comprising a horizontal bottom portion and vertical sidewalls for containing the wood and ash generated by the decomposition of the wood;

said cover having a plurality of holes formed therein and hingably mounted on said wood container so that the wood is entirely contained within said cover and container, said holes permitting smoke and heated air to escape from within said wood container while preventing flareup of the wood during the cooking operation and when said door assembly of said oven is opened; and

said cover being hingably mounted to said container by pin means secured to said container passing through elongated slot means within said cover, said elongated slot means permitting adjustment of said cover to permit enclosure of wood extending beyond the upper edge of the sidewalls of said wood container.

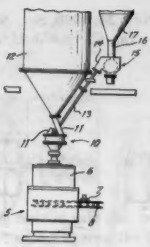
4,355,571

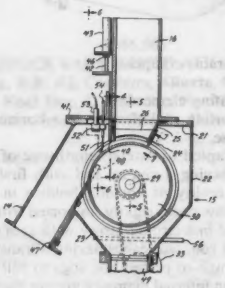
AROMATIZING APPARATUS

Oscar W. Stoeckli, Rye, N.Y., and David J. Berry, Montvale, N.J., assignors to General Foods Corporation, White Plains, N.Y.

Filed Dec. 29, 1980, Ser. No. 220,927
Int. Cl.³ A23L *3/34*
U.S. Cl. 99—485 **10 Claims**

1. In an aromatizing apparatus for dispersing an aroma-enriched liquid throughout a mass of adsorbent particulate material comprising, a circular member mounted for rotation in an assembly which includes a material in-feed chute and a material discharge chute, said member containing at least one peripheral groove of uniform cross-section disposed to receive material from said in-feed chute, said member while rotating carrying a ribbon of said material within the confines of said groove from said in-feed to said discharge chute, an injector member disposed to continually dispense said liquid into said ribbon carried from said in-feed to said discharge chute, and a pump member in liquid communication with said injector and driven in synchronism with said circular member for supplying





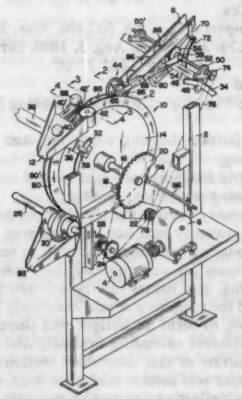
said injector with said liquid at a predetermined weight ratio to the material discharged by said circular member.

4,355,572

APPARATUS FOR SEPARATING THE PULP FROM THE SKIN OF FRUIT SUCH AS TOMATOES

Jesus A. Silvestrini, Mendoza, Argentina, assignor to IMDEC S.R.L., Mendoza, Argentina

Filed Apr. 13, 1981, Ser. No. 253,373
Int. Cl.³ A23N *7/00*
U.S. Cl. 99—516 **12 Claims**



1. Apparatus for separating the pulp from the skin of fruit, such as tomatoes, which are supplied to the apparatus, comprising.

a support frame for mounting the component parts of said apparatus;

carrying means rotatively driven and rotatively mounted to said support frame;

gripping means, comprising mutually opposed members travelling around an endless circular path, supported by said carrying means and interposed between said supplied fruit and said carrying means, said gripping means comprising resiliently deflectable members formed from a resilient synthetic resin and extending toward one another in the direction toward said carrying means, whereby is formed a trough for the gripping support of said supplied fruit by gripping the outer surface of the skin of each said supplied fruit on opposite sides of a plane extending through said fruit and for transporting said fruit along a first predetermined portion of said circular path extending between a fruit receiving position and a pulp discharge position;

means positioned generally adjacent said gripping and transporting means, between said receiving position and said pulp discharge position, for producing a cut through a portion of said fruit skin remote from said gripping and transporting means and in a plane generally through the stem axis of the fruit;

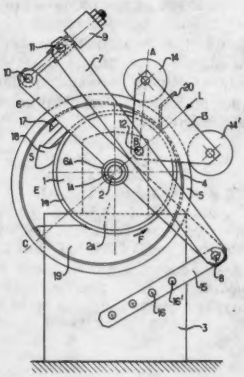
means operatively mounted to said support frame and positioned adjacent said pulp discharge position for cooperating with the centrifugal force imparted by transport of the fruit around said circular path for urging said pulp away from said gripping and transporting means through said cut in said skin while retaining said skin gripped thereby, whereby the pulp may be separated from the skin.

4,355,573

CONTINUOUS PRESS FOR DEHYDRATING PULPS

Jean-Luc Berry, Compiegne, France, assignor to Gie Valpron, France

Filed Dec. 1, 1980, Ser. No. 211,689
Int. Cl.³ B30B *9/20*
U.S. Cl. 100—121 **7 Claims**



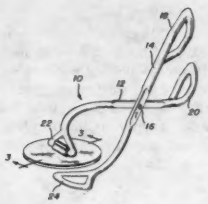
1. A continuous press adapted to press products such as vegetables, fruits, fodder or the like, comprising: an external crown; a central wheel mounted for rotation on a shaft and having a diameter smaller than the diameter of said crown, said wheel being mounted within said crown so as to form a rotary assembly of two cylinders internally tangent with respect to each other and between which said products are pressed; at least one support on which freely-rotating spools are mounted, said spools bearing upon the outer circumference of said external crown; and means for tangentially urging said crown and said wheel against one another to impart a contact force between them, said means comprising first and second pairs of levers located on either side of said rotating assembly, said first pair of levers being pivotally mounted on said shaft on which said wheel is mounted and said second pair of levers being pivotally connected to said at least one support on which said spools are mounted, said two pairs of levers being pivotally connected at one of their end regions about a common point, said urging means further comprising an adjustable tightening means provided at the other of the end regions of said pair of levers for urging said respective pairs of levers towards or away from one another for varying the force with which said spools bear upon the outer circumference of said external crown to correspondingly vary the force of contact between said crown and said wheel.

4,355,574

CAN PRESS IMPLEMENT FOR CANNED FOOD PRODUCTS

James M. Bond, 106 W. Church St., and Robert P. Dail, P.O. Box 426, both of Edenton, N.C. 27932

Filed Mar. 26, 1981, Ser. No. 248,025
Int. Cl.³ B30B *7/00*
U.S. Cl. 100—234 **10 Claims**



1. A liquid-expressing tong-like implement for removing liquid from a can of food product containing solid food product immersed in liquid, comprising tongs formed of a pair of scissor-like elongated arms pivoted together at intermediate portions thereof, each arm having a finger loop formation at a handle-forming rear end portion thereof by which to manipulate the tongs, the arms having front end portions at the ends opposite said finger loop formations providing loop-shaped jaw formations, one of the jaw formation loops having a generally straight rod-like front leg portion extending transversely of its associated elongated arm, a flat platen member sized to fit into an opened food product can to exert pressing forces onto the solid food product and a coupling formation pivotally coupling the platen to said rod-like leg portion for pivotal movement about that transversely arranged leg portion, the other of said jaw formation loops having surfaces defining a flat portion to engage the bottom of the opened can whereby the food product may be compressed between said platen and the bottom of the can while the tongs hold the can to express the liquid therefrom.

4,355,575

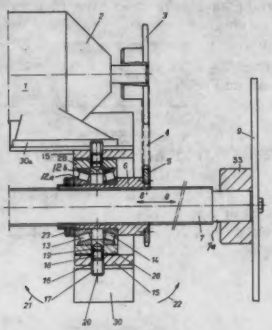
PRESS PLATE DRIVE FOR A BALING PRESS

Albert Goldhammer, Zum Hecht 46, 7770 Überlingen, Fed. Rep. of Germany

Filed Oct. 14, 1980, Ser. No. 196,177
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1979, 2942227; Oct. 18, 1979, 2942239
Int. Cl.³ B30B *1/18*
U.S. Cl. 100—245 **6 Claims**

1. A pressing plate drive construction for a baling press or the like which comprises, a housing, a pressing plate operatively mounted in a guided track means within the housing for longitudinal advancing movement therewithin, a longitudinally extending operating spindle carrying said plate on a front end thereof, bearing means carrying said spindle in an axially forwardly movable relation within the housing, said spindle

having a threading therealong, a spindle sleeve having a cooperating inner threading to operatively mount it on said spindle shaft, rotatable motor means mounted on the housing, driving connections between said motor means and said spindle sleeve for rotating said sleeve to move said spindle shaft longitudinally within said housing, universal bearing means positioned



between said housing and said spindle sleeve for taking up axial and radial thrust exerted by said spindle shaft on said spindle sleeve, said bearing means having a group of axially opposed sets of roller bearings, a pressure housing carried by said housing to support said roller bearings, and said roller bearings being mounted in an axially inclined relation between said spindle sleeve and said pressure housing.

4,355,576

PROCESS OF OFFSET PRINTING ON SHEET MATERIAL WITH HIGH VISCOSITY GREASY INK

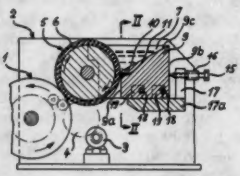
Jarl-Erik S. I. Ohlsson, Stockholm, Sweden, assignor to Texogesa S.A., Switzerland

Division of Ser. No. 681,199, Apr. 28, 1976, abandoned, which is a continuation-in-part of Ser. No. 624,295, Oct. 20, 1975, abandoned, which is a continuation of Ser. No. 500,550, Aug. 26, 1974, abandoned. This application Aug. 4, 1977, Ser. No. 821,949

Claims priority, application Switzerland, Sep. 28, 1973, 12278/73; Jul. 31, 1974, 10554/74

Int. Cl.³ B41F *31/06*; B41L *27/08*

U.S. Cl. 101—426 **8 Claims**



1. A process of offset printing on sheet material with high viscosity greasy ink with a rotary offset printing press having a horizontal rotatable plate cylinder, a horizontal rotatable inking cylinder for applying ink to the plate cylinder, said inking cylinder having a covering layer of flexible plastic material, means for rotating said plate cylinder and inking cylinder in contact with one another in opposite directions at equal peripheral speeds about parallel horizontal axes, and an inking device for applying a uniform thin film of said high viscosity greasy ink to the inking cylinder for transfer to the plate cylinder,

said inking device comprising a rotary small diameter horizontal wiping rod disposed laterally of said inking cylinder and engaging the peripheral surface of the inking cylinder in a contact zone extending horizontally along the inking cylinder on the side thereof where the peripheral surface of the inking cylinder is moving downwardly, means for pressing the wiping rod against and into the elastic covering layer of the inking cylinder in said contact zone, variable speed electric motor means for rotating the wiping rod independently of said inking cylinder at a continuously variable speed in the same direction of rotation as the inking cylinder so as to move the peripheral surface of the wiping rod upwardly in said contact zone, and trough means for holding a body of said greasy ink against said inking cylinder in a space extending upwardly from said contact zone, said pressing means comprising a horizontal rigid elongate body having at one side thereof a longitudinal V-shaped groove facing said inking cylinder and rotatably receiving said wiping rod, said elongate body having in said groove bearing surfaces of very hard material which bear on said wiping rod in line contact and thereby wipe ink from the peripheral surface of said wiping rod in a zone between exposure of said wiping rod to said body of ink and engagement of said wiping rod with said inking cylinder,

said process comprising supplying to said trough means, high viscosity greasy ink having a viscosity at least of the order of 50 poise, rotating said inking cylinder and plate cylinder in directions to move the peripheral surface of said inking cylinder downwardly through said contact zone so as to carry a film of said ink on said inking cylinder from said body of ink down past said wiping rod, pressing said wiping rod against and into the elastic covering of said inking cylinder so that variation in penetration of said wiping rod into said elastic covering has little effect on the thickness of said ink film, rotating said wiping rod in the same direction of rotation as said inking cylinder at a selected speed of rotation so that the peripheral surface of said wiping rod moves upwardly in said contact zone, wiping ink from the peripheral surface of said wiping rod subsequently to exposure of said peripheral surface of the wiping rod to said body of ink and prior to engagement of said peripheral surface of the wiping rod with inking cylinder in said contact zone, sensing the optical density of an area printed on said sheet material and controlling the speed of said variable speed electric motor to adjust the speed of rotation of said wiping rod to maintain the optical density of said printing constant and uniform at a selected value.

4,355,577

MODEL ROCKET PROPULSION SYSTEM

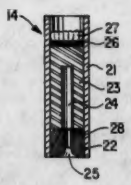
Michael S. Ady, 506 - 11011 - 86 Ave., Edmonton, Alberta, Canada (T6G 0X1); Roger F. Lufkin, 504 - 9809 - 110 St., Edmonton, Alberta, Canada (T5K 1J1), and Kevin L. Lynch, 12015 - 133 Ave., Edmonton, Alberta, Canada (T5E 1E8)

Filed Aug. 25, 1980, Ser. No. 180,917

Claims priority, application Canada, Aug. 24, 1979, 334399

Int. Cl.³ F42B *15/10*

U.S. Cl. 102—378 **5 Claims**



1. A propulsion motor for a toy rocket comprising:

(a) an elongate, open ended tubular casing;

(b) nozzle means formed from a plastic composition com-

prising the following ingredients in the following percentages by weight ranges:

Furan Resin Binder (liquid)	40–99
Corn Starch Filler (fine powder)	0–60
Catalyst	1–5; and

located within said casing adjacent the lower end thereof, said nozzle means having a passageway formed longitudinally therethrough, which passageway, at one end, is provided with a restricted throat section;

(c) a solid propellant grain located within said casing intermediate the length thereof, said grain having a substantially cylindrical elongate burning port extending partway therethrough, said port having a diameter substantially greater than the diameter of said nozzle throat section, said grain being further located within said casing adjacent said nozzle means such that said port is indexed with said passageway, and;

(d) ejection charge means, located within said casing in intimate contact with the top end surface of said propellant grain.

4,355,578

RAILWAY WHEELS AND RAILS DAMPING STRUCTURES

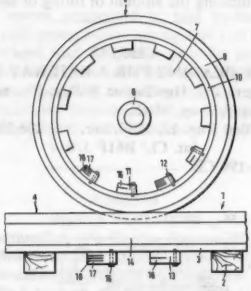
Erwin Raquet, Witten, Fed. Rep. of Germany, assignor to Fried. Krupp Hüttenwerke AG, Bochum, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 30,861, Apr. 17, 1979, abandoned. This application Jul. 24, 1979, Ser. No. 60,181

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1978, 2816561

Int. Cl.³ B60B *17/00;* **B60C** *7/06;* **E01B** *19/00;* **F16F** *15/12*

U.S. Cl. 104—1 A **11 Claims**



1. In a system for absorbing a rail wheel's radial vibrations, said rail wheel having a rim, an axle hub and a web interconnecting said axle hub with said rim, said system including a plurality of independent vibration absorbers, the improvement comprising:

a circumferential series of said vibration absorbers forming wheel vibration absorbers circumferentially interspaced along said rim;

said wheel vibration absorbers being tuned to a radial resonant frequency of said rail wheel induced by said rail wheel's radial vibrations; and

said wheel vibration absorbers being oriented to damp radial vibration.

7. In a system for absorbing a rail wheel's radial vibration, includes a rail on which a rail wheel is adapted to ride, said rail is supported by conventional railroad ties and is provided with vibration absorbers, the improvement comprising:

a series of said vibration absorbers forming rail vibration absorbers connected on said rail and interspersed between said railroad ties;

said rail vibration absorbers being tuned to absorb the vertical vibrations forced onto said rail by said wheel vibrations; and

said rail vibration absorbers being oriented to damp vertical vibrations.

4,355,579

TRACK TAMPER

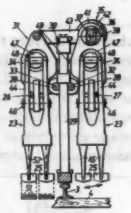
Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Nov. 17, 1980, Ser. No. 207,336

Claims priority, application Austria, Dec. 12, 1979, 7847/79

Int. Cl.³ E01B *27/16*

U.S. Cl. 104—12 **10 Claims**



1. A mobile track tamper comprising a frame arranged on a track consisting of a multiplicity of ties and two rails fastened to the ties, the rails intersecting each tie at respective points of intersection and ballast supporting the track rails at each point of intersection, and a tamping head vertically movably mounted on the frame for vertical alignment with the respective points of intersection, the tamping head including

(a) a carrier supporting two pairs of ballast tamping tool implements arranged for reciprocation in the direction of track elongation towards and away from each other and a respective one of the ties positioned between the tamping tool implements of each pair, each pair of the ballast tamping tool implements being arranged at a respective side of each rail in a direction transverse to the track and the ballast tamping tool implements being immersible in the ballast upon vertical movement of the tamping head for tamping ballast under the respective tie upon reciprocation of the implements,

(b) a reciprocating power drive for the ballast tamping tool implements of each pair,

(c) a respective carrier part supporting a respective one of the pairs of the ballast tamping tool implements on each side of the rail,

(d) a pivot extending in the direction of elongation of the machine and supporting the carrier part on the carrier for pivoting in a plane extending transversely of said direction, and

(e) a vibrating power drive means connected to the carrier part and imparting to the tamping tool implements an oscillatory vibrating motion in a plane extending perpendicularly to the pivot in each position of the tamping tool implements.

4,355,580

INEXPENSIVE DRIVERLESS VEHICLE

Russell Scheel, Easton, Pa., assignor to SI Handling, Inc., Easton, Pa.

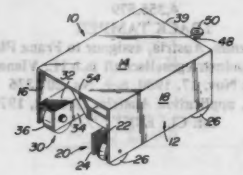
Filed Nov. 24, 1980, Ser. No. 209,810

Int. Cl.³ B61B *13/12*

U.S. Cl. 104—166 **10 Claims**

1. A driverless vehicle comprising an inverted U-shaped metal body with the bight being a horizontal load supporting surface, said body being open at the front and rear end, a pair of wheels supported by each leg of said body, a friction drive

wheel supported by said bight between said legs for contact with a drive shaft, an upright support member for said drive wheel, a first cam follower rotatably supported by said upright support member for contact with a control member for moving the drive wheel from its drive position to an accumulation position, means biasing said drive wheel to a drive position, a bumper projecting from the front end of the body and connected to said drive wheel for moving the drive wheel from its drive position to an accumulation position, and a cam disposed between said legs adjacent the rear end of the body for causing a bumper on a similar vehicle to move its drive wheel to an accumulation position, said cam being at an elevation which at least partially overlaps the elevation of a second cam follower on one end of said accumulation bumper.



4,355,581

TRUCK DRIVING APPARATUS

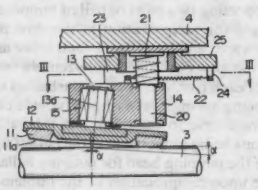
Yoshio Mitani, Inayama, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kajo, Japan

Filed Jan. 28, 1980, Ser. No. 115,727

Claims priority, application Japan, Jan. 31, 1979, 54-10553; Oct. 30, 1979, 54-140758

Int. Cl.³ B61B *13/12*

U.S. Cl. 104—166 **5 Claims**



1. A driving means for a truck having at least one wheel rotatably connected to said truck and positioned on at least one track for moving said truck, and a drive shaft disposed along said track for providing motor power to said driving means to propel said truck; said driving means comprising

(A) a supporting shaft vertically fixed to and hung from said truck;

(B) a bracket supported on said supporting shaft so that the bracket can move along said supporting shaft and rotate relative to said supporting shaft;

(c) a rotation shaft rotatably supported on said bracket;

(D) a ring like friction disc fixed to a lower end of said rotation shaft, wherein said friction disc has a friction face intersecting the rotational axis of said rotation shaft substantially at right angles;

(E) a spring mounted on said supporting shaft to urge said bracket to press said friction face onto said driving shaft, said rotation shaft being disposed so that the rotation axis of said rotation shaft is slightly inclined with respect to a plane intersecting the rotation axis of said driving shaft at right angles;

(F) a second spring;

wherein said bracket is urged by said second spring to turn around said supporting shaft;

(G) a stop means positioned to control the stopped turning movement of said bracket so that said stop means falls in abutting contact with said bracket at the stopped position;

(H) a cam mounted on said track; and

(I) an arm fixed to said bracket whereby said arm is abutted against said cam to turn said bracket around said support shaft.

4,355,582

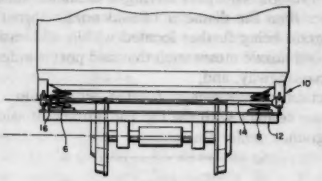
RAILWAY CAR TILT CONTROL SYSTEM

John A. Germer, Doylestown, Pa., assignor to The Budd Company, Troy, Mich.

Filed Jul. 3, 1980, Ser. No. 165,948

Int. Cl.³ B61F *3/08, 5/24, 5/50*

U.S. Cl. 105—164 **10 Claims**



1. In combination with means for tilting a railway car body with respect to a truck in response to lateral acceleration forces,

(a) means for detecting lateral acceleration forces in said railway car;

(b) an actuator included in said means for tilting for receiving forces to cause said tilting;

(c) means connected between said lateral acceleration forces and said actuator to tilt said railway car when said acceleration forces exceed predetermined levels, and

(d) means for limiting the amount of tilting of said railway car.

4,355,583

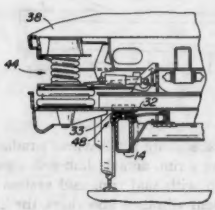
SIDE BEARING FOR A RAILWAY CAR

Walter S. Eggert, Jr., Huntington Valley, Pa., assignor to The Budd Company, Troy, Mich.

Filed Nov. 12, 1980, Ser. No. 206,305

Int. Cl.³ B61F *5/014*

U.S. Cl. 105—199 CB **6 Claims**



1. In combination with a car body carried by a bolster supported on a pair of side frames,

an integral bearing assembly disposed between said bolster and each of said side frames, comprising:

(a) top and bottom plate members extending along each of said side frames;

(b) an elastomeric cushion member disposed between said top and bottom plate members;

(c) an elastomeric strip secured to said bottom plate members between said bottom plate and said associated bolster;

(d) said elastomeric member including a plurality of openings therein; and

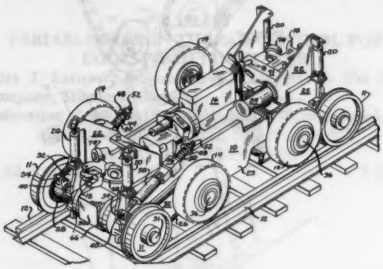
(e) said openings extending in opposite directions and becoming progressively larger as they extend from the center of said side bearing.

4,355,584

RETRACTABLE WHEELED VEHICLE

Eugene B. White, Jr., Park Forest, Ill., assignor to White Machinery Corporation, Joliet, Ill.

Filed May 21, 1979, Ser. No. 40,855
Int. Cl.³ B61C 11/00
U.S. Cl. 105—215 C 4 Claims



1. In a rail car moving vehicle including non-retractable front and rear pairs of rail wheels, and a plurality of retractable road wheels, which vehicle can move on the rails when said road wheels are retracted and can move on the ground when said road wheels are extended downwardly, certain of said road wheels being upwardly retractable by rotation of arm means carrying said retractable wheels, and hydraulic cylinder means controlling the rotational position of said arm means and retractable wheels, the improvement comprising, in combination:

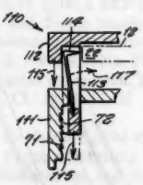
movable rod means connected to said hydraulic cylinder means, and coil spring means urging said rod means toward a position where said hydraulic cylinder means and arm means position said retractable wheels in a relatively downward rotational position, whereby said retractable wheels may be alternatively retracted and lowered by the hydraulic cylinder means, while also possessing a spring suspension system.

4,355,585

SHELF BUILDERS

Wilbert O. Bottamiller, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10007

Filed Aug. 18, 1978, Ser. No. 935,015
Int. Cl.³ A47B 3/06
U.S. Cl. 108—153 2 Claims



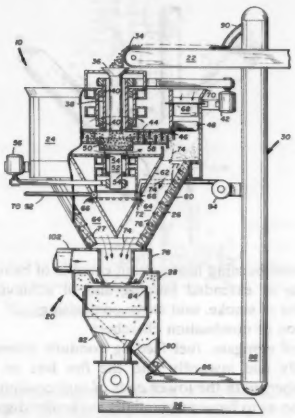
1. A shelf builder comprising in combination a vertical wall and a horizontal shelf, said wall including an upper member and a lower member for retaining said shelf therebetween said members being relatively adjustable including interfitting ratchet teeth on both said members for retaining said members in adjustable positions wherein an end of said shelf extends part way inside an opening inside said wall wherein a flexible inclined pin is mounted at its lower end on a ratchet clip and at its upper end in a recess in said upper member adjacent said shelf said pin includes a pointed tip for piercing transversely an end of said shelf, said inclined pin being urged by an abutting portion of said upper member to move transversely when said members are adjusted together so that said tip pierces said shelf end.

4,355,586

SOLID FUEL GASIFICATION SYSTEM

Charles K. Brown, 8317 Robert Bruce Dr., Richmond, Va. 23235

Filed Nov. 17, 1980, Ser. No. 207,648
Int. Cl.³ F23G 5/00
U.S. Cl. 110—229 9 Claims



1. A solid fuel gasification system, comprising:

a solid fuel gasification section, said solid fuel gasification section having a fuel feed means, a gas cleaning section, said gas cleaning section being connected to said solid fuel gasification section, a fuel pulverizing means, a thermal gasification means, and a separation means, said fuel pulverizing means being connected to said fuel feed means, said thermal gasification means being connected to said fuel pulverizing means, and said separation means being connected to said thermal gasification means, said fuel pulverizing means having a hollow shaft means, an upper pulverizing rotor, a plurality of first annular concentric rings, a lower pulverizing rotor, a plurality of second annular concentric rings, and a solid shaft means, said upper pulverizing rotor being centrally affixed to said hollow shaft means, said upper pulverizing rotor having an upper and a lower surface, said plurality of first annular concentric rings being affixed to the lowermost surface of said upper pulverizing rotor, said plurality of first annular concentric rings projecting downwardly from said lowermost surface of said rotor, said lower pulverizing rotor having an upper and a lower surface, the plane of said lower pulverizing rotor being parallel to and spaced from the plane of said upper pulverizing rotor, said plurality of second annular concentric rings being affixed to the uppermost surface of said lower pulverizing rotor, said plurality of second annular concentric rings projecting upwardly from said uppermost surface of said rotor, said solid shaft means being centrally affixed to said lower pulverizing rotor, the centerline of said solid shaft means coinciding with the centerline of said hollow shaft means, said thermal gasification means having an outside wall means, an inside wall means, and an annular ring burner, said outside wall means being of a conical-like configura-

tion, said inside wall means being of a conical-like configuration and spaced from and parallel to said outside wall means, said spaced area between said outside and said inside wall means forming a gasification chember, said annular ring burner encircling said inside wall means and being spaced from the ends of said inside wall means, said annular ring burner being capable of supplying a peripheral flame around and across said gasification chamber.

4,355,587

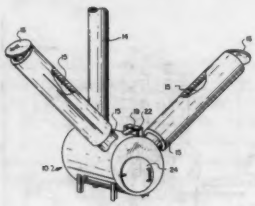
SELF-FEEDING WOOD BURNING HEATING UNIT

Wilfred T. Lemon, P.O. Box 1293, Hailey, Id. 83333

Filed Oct. 25, 1979, Ser. No. 87,826

Int. Cl.³ F23K *3/00*

U.S. Cl. 110—293 **10 Claims**



1. A wood burning heating unit capable of being stoked for continuous or extended burning and of achieving effective combustion of smoke, said stove comprising:

a fire box or combustion chamber;

a pair of elongate, fuel feeding conduits extending downwardly and inwardly into the fire box or combustion chamber, with the lower ends of said conduits being beveled so as to have substantially vertically disposed spaced apart openings which face each other, and with the upper ends of said conduits being adjusted to receive elongate pieces of firewood longitudinally therein, so that the respective, generally upstanding columns of firewood are formed in the conduits, with the lower ends of the firewood columns contacting each other in the space between the openings in the lower ends of said conduits, whereby the columns of firewood continuously move downwardly in the conduits as the lower ends of the wood columns are burned;

an exhaust conduit in flow communication with the fire box or combustion chamber for exhausting combustion gases therefrom; and

manifold means for supplying a flow of combustion air to the proximity of the contact between the two columns of firewood.

4,355,588

TRANSPLANTING MACHINE

Errol C. Armstrong; Javier Diaz-Infante, and David J. Hall, all of Salinas, Calif., assignors to Bud Antle, Inc., Salinas, Calif.

Filed May 16, 1980, Ser. No. 150,486

Int. Cl.³ A01C *11/02*

U.S. Cl. 111—3 **12 Claims**

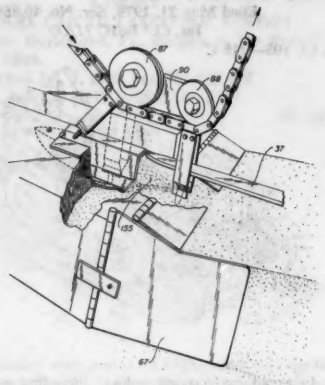
1. A method for planting a cylindrical plug containing a seedling in the ground from a moving platform comprising the steps of:

opening a furrow of controlled depth in the ground by means attached to said platform;

gripping a plug between opposing faces of bladelike pieces of a clip means;

conveying said gripped plug by said clip means to a vertical position along a horizontal path within said furrow while said platform is moving, a portion of said blade-like pieces being disposed below ground level with edges aligned along the direction of movement;

maintaining said plug generally stationary at said vertical position with said gripping mechanism while means attached to said moving platform closes soil around said plug at a controlled depth partially covering a portion of said blade-like pieces;



thereafter separating said blade-like pieces to release said plug; and

thereupon withdrawing said blade-like pieces from the soil along a plane of narrowest cross section of said blade-like piece to minimize disturbance of soil about said plug.

4,355,589

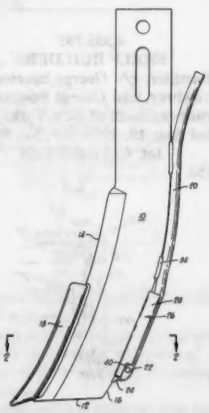
FERTILIZER APPLICATOR KNIFE ASSEMBLY

Halsey J. Wetmore, Guymon, Okla., assignor to Adams Hard-Facing Company, Inc., Guymon, Okla.

Filed Mar. 16, 1981, Ser. No. 244,037

Int. Cl.³ A01C *23/02*

U.S. Cl. 111—7 **9 Claims**



1. A fertilizer applicator knife assembly comprising:

a shank having a leading edge, a trailing edge and a foot;

an earth-cutting wear insert mounted on the leading edge of the blade shank;

an elongated fertilizer tube secured at spaced intervals to the trailing edge of the shank; and

a tube protective spacer removably inserted and wedged between the tube and shank at a location between points of securement of the tube to the shank trailing edge, said tube protective spacer being unsecured to said shank and unsecured to said tube to facilitate removal thereof from between said shank and said tube, said spacer being an elongated metal block having a generally rectangular cross section, a front, a back, and two sides.

4,355,590

VARIABLE BOBBIN THREAD CONTROL FOR LOCKSTITCH LOOPTAKER

Stanley J. Ketterer, Jamesburg, N.J., assignor to The Singer Company, Stamford, Conn.

Continuation of Ser. No. 55,847, Jul. 9, 1979, abandoned. This application Mar. 13, 1981, Ser. No. 243,412

Int. Cl.³ D05B *57/14, 59/00*

U.S. Cl. 112—184 **7 Claims**

1. In a lockstitch forming sewing machine having a looptaker comprising a circularly moving looptaker body formed with an annular raceway for accommodating a bobbin within a bobbin case constrained against motion with said looptaker having thread guiding means for directing a bobbin thread from said bobbin between said stationary bobbin case and said circularly moving looptaker body, variable bobbin thread pull-off and retraction means carried by said looptaker body in a position to act on said bobbin thread for drawing a supply of bobbin thread from said bobbin and selectively retracting bobbin thread following stitch formation, and means for enabling variation of the position of said variable bobbin thread pull-off and retracting means on said looptaker body without removing said bobbin so that variation of said variable bobbin thread pull-off and retracting means may be effected at stitch selection to change the timing of engagement with said bobbin thread of said bobbin thread pull-off and retracting means to change the pull-off amount, or retraction amount.

4,355,591

NEEDLE THREADERS FOR A SEWING MACHINE

Minoru Itoh, Kisozaki, and Toshio Sasaki, Inazawa, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Filed Jun. 3, 1981, Ser. No. 270,140

Claims priority, application Japan, Jun. 24, 1980, 55-86033

Int. Cl.³ D05B *87/02*

U.S. Cl. 112—225 **4 Claims**

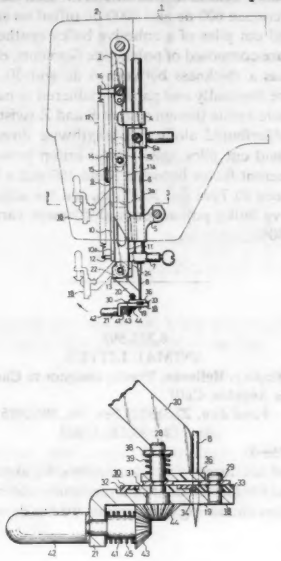
1. A needle threader for threading the eye of a needle on a sewing machine with a frame, comprising

a support movably mounted on said frame and provided with a needle accommodating notch,

a pair of resilient rollers rotatably mounted on said support in the proximity of said notch, and contacting at the respective peripheral edge with each other for gripping the thread therebetween,

means disposed between said support and said needle for positioning said support with the tangent line passing through the contact portion of said rollers in alignment with the eye of said needle accommodated in said notch, and

thread guide means provided on said support at the opposite side of said notch relative to the contact portion of said



rollers, and guiding the insertion of the thread toward the proximity of the contact portion of said rollers,

said resilient rollers being rotated to grip and transfer the thread toward the eye of said needle.

4,355,592

COHESIVE BULKY CARPET YARN OF A POLYAMIDE CONTINUOUS MULTIFILAMENT AND A CUT PILE CARPET

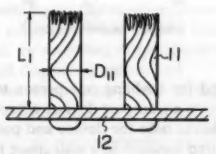
Koji Tajiri; Mikio Oohara, and Kiyoshi Maruo, all of Mihara, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Jul. 12, 1979, Ser. No. 56,843

Claims priority, application Japan, Jul. 19, 1978, 53-87141; Jul. 20, 1978, 53-98828[U]; Jul. 26, 1978, 53-90376

Int. Cl.³ D05C *17/02;* **D02G** *1/02, 3/26*

U.S. Cl. 112—410 **5 Claims**



1. A cohesive bulky carpet yarn having a total thickness between 600 de and 6000 de and made of polyamide continuous multifilament yarn, each of which filaments has a thickness between 6 de and 30 de, wherein the total crimp of said yarn is between 3% and 15%, filaments composing said yarn are partially and thermally adhered to each other and said yarn has alternate twists so that S twist portions and Z twist portions are distributed randomly along the lengthwise direction of said yarn, and said yarn has a coherent factor between 5 and 100, a

latent torque index between 20 T/m and 300 T/m, and an adherent ratio between 0.5% and 40%.

2. A cut pile carpet comprising a substrate and cut piles of a cohesive bulky synthetic multifilament yarn having a total thickness between 600 de and 6000 de tufted on said substrate, wherein said cut piles of a cohesive bulky synthetic multifilament yarn are composed of polyamide filaments, each of which filaments has a thickness between 6 de and 30 de, and said filaments are thermally and partially adhered to each other and have alternate twists therein so that S and Z twist portions are randomly distributed along the lengthwise direction of said yarn, and said cut piles have a total crimp between 3% and 15%, a coherent factor between 5 and 100 and a latent torque index between 20 T/m and 300 T/m, and the adherent ratio of said cohesive bulky polyamide multifilament yarn is between 0.5% and 40%.

4,355,593

ANIMAL LITTER

Ronald B. Stapley, Bellevue, Wash., assignor to Carnation Company, Los Angeles, Calif.

Filed Jun. 27, 1977, Ser. No. 809,985
Int. Cl.³ A01K *1/015*
U.S. Cl. 119—1 **16 Claims**

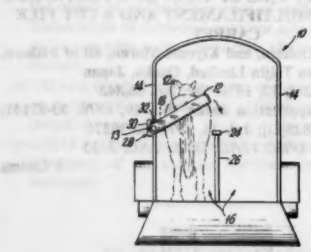
1. An animal litter which comprises an absorptive litter material and a minor amount of a sagebrush material sufficient to mask odors emanating from animal wastes deposited on the litter.

4,355,594

LOADING DEVICE AND LOADING METHOD FOR HORSE TRAILERS AND THE LIKE

Mary H. Wagner, 1009 Forest Rd., Perkasie, Pa. 18944

Filed Oct. 17, 1979, Ser. No. 85,538
Int. Cl.³ B60P *3/04*
U.S. Cl. 119—7 **17 Claims**



15. A method for enabling one person to load a horse, or other animal, onto a transport device, comprising the steps of:

leading the horse onto the device and positioning the horse in the desired location in a stall space on the device; and

causing, from the front of the stall space, a restraining arm member located generally at the back end of the device to move behind the horse, generally at about the level of the horse's rump, by causing the arm member to rotate from a generally vertically extending orientation to a generally horizontally extending orientation; and

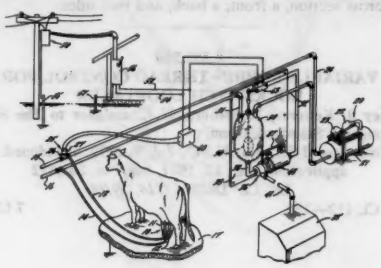
positioning catch means on the device to prevent rotation of the arm member beyond a predetermined point, such that when the horse tries to back up it is essentially restrained from further backward movement by said arm member.

4,355,595

CENTRAL MILKING SYSTEM WITH REDUCED STRAY CURRENT PROBLEMS

Roger A. Ackerman, 3517 N. Henderson Rd., Freeport, Ill. 61032, and Kurt A. Ackerman, Freeport, Ill., assignors to Roger A. Ackerman, Freeport, Ill.

Filed Mar. 16, 1981, Ser. No. 244,103
Int. Cl.³ A01K *1/12*
U.S. Cl. 119—14.03 **11 Claims**



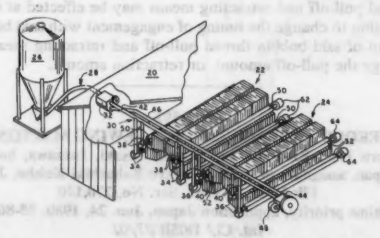
1. In a piped, central collection milking system which includes electrical units associated with an electrical power source having an earth grounded neutral conductor, said system further including electrically conductive components which are directly electrically connected to said neutral conductor, the improvement in said system comprising, means creating a highly electric-insulating path between (a) all electrically conductive components of the system which are directly connected to said neutral conductor and (b) all bodies or films of liquid milk which extend to the teat of an animal being milked.

4,355,596

POULTRY FEEDER HAVING SEQUENTIAL CONTROL

William Peppler, Decatur, Ala., assignor to Chore-Time Equipment, Inc., Milford, Ind.

Filed Mar. 7, 1980, Ser. No. 128,271
Int. Cl.³ A01K *5/00, 39/012*
U.S. Cl. 119—18 **11 Claims**



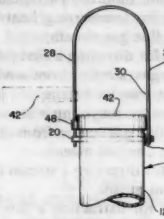
6. A system for conveying feed to a plurality of groups of animals comprising: a plurality of feed conveying means associated with each group of animals for conveying feed to each said group; feed supply means connected in common to all said feed conveying means for supplying feed to said feed conveying means; and control means for automatically sequentially operating said feed conveying means so that fewer than all of said feed conveying means are operative at a time and wherein said control means is arranged to interrupt the operation of said feed supply means between the sequential operations of said feed conveying means.

4,355,597

BIRD FEEDER CONSTRUCTION

Morton L. Blasbalg, 26 Sandro Dr., Warwick, R.I. 02887

Filed Aug. 7, 1981, Ser. No. 290,888
Int. Cl.[3] A01K *39/00*
U.S. Cl. 119—51 R 5 Claims



1. A bird feeder and the like comprising a vertically disposed housing including a hollow tubular body adapted to receive and dispense feed, said housing further including a generally U-shaped wire-like bail having opposite legs thereof respectively connected to said housing adjacent opposed body sidewall positions at its upper end thereof and through which said body is supported in such vertical disposition, said body upper end being normally open and a top cover adapted for positioning over said normally open upper body end so as to close such in order to protect said seed from weather, feeding pests, and the like, said closure connected to only one of said bail legs for vertically slidable and horizontally rotatable movement with respect thereto such that free access for feed filling may be had to said body without removing either said cover from said bail or said bail from said body by initially sliding said cover upwardly out of contact with said body along said one bail leg and then subsequently rotating said cover around said bail to a position horizontally offset from said body so as to expose said open body top said cover having an outwardly extending ear through which a vertically oriented bore extends, said one of the bail legs extending through said bore whereby said cover is rotatable about said one bail leg, said bail legs connected to supporting means disposed on opposite sidewall portions near the open body top, the other of said bail legs frictionally releasably connected to said supporting means such that the bail may be moved relative to its connection by said one bail leg to both said closure and said supporting means such that the feeder may be easily released from a running length support.

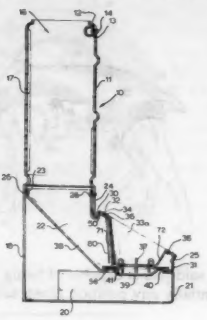
4,355,598

ANIMAL FEEDER WITH AUTOMATIC DISPENSER

Dana H. Saylor, 1572 Renderer, Warson Woods, Mo. 63122

Filed Feb. 12, 1981, Ser. No. 233,902
Int. Cl.[3] A01K *5/00*
U.S. Cl. 119—52 A 8 Claims

1. An animal feeder comprising, a hopper, a feed pan member attached to the lower end of said hopper and having a first floor portion which extends downwardly from said hopper and a substantially horizontal second floor portion which joins said first floor portion, a cover member attached to said feed pan member, an inverted conically-shaped animal mouth receptacle formed in said cover member and formed with a lower open end which is spaced from said second floor portion of said feed pan member, and a ring shaped agitator mounted in the lower end of said conically-shaped member for movement in the horizontal plane and having feeder fingers which extend beyond the lower end of said conically-shaped member to engage feed and move it into said opening wherein said agitator has a plurality of substantially vertical members with lower portions engageable with said second floor portion and having upper portions which extend up into said opening in the lower end of said conically-shaped receptacle and including a depression formed in said second floor portion under said conically-



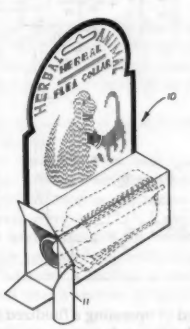
shaped receptacle into which said lower portions of said agitator are received to hold the agitator in position.

4,355,599

FLEA COLLAR KIT

Scott A. Fickes, 461 Cavour St., Oakland, Calif. 94618, and William A. Welch, 1161 Langley Way, Rodeo, Calif. 94572

Filed May 12, 1981, Ser. No. 263,010
Int. Cl.[3] A01K *27/00*; B65D *77/02*
U.S. Cl. 119—106 5 Claims



1. A flea collar kit for controlling flea infestation of an animal comprising

a container having a liquid flea repellent therein,

dispensing means for selectively drawing a predetermined quantity of said liquid flea repellent from said container,

elongated and adjustable collar means, composed of a porous material, for absorbing drops of said liquid flea repellent from said dispensing means, and

a holding means for retaining said container, dispensing means, and collar means.

4,355,600

PROTECTIVE BODY SUIT FOR ANIMALS

Gloria J. Zielinski, 716 Scenic Dr., West Trenton, N.J. 08628

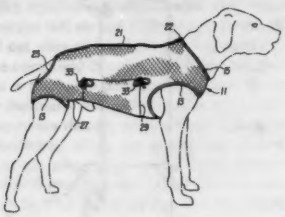
Filed Dec. 19, 1980, Ser. No. 218,436
Int. Cl.[3] B68C *5/00*; A61D *9/00*; A01K *29/00*; A61F *5/40*
U.S. Cl. 119—143 10 Claims

7. A protective body covering for an animal comprising:

a tube of open mesh elastic fabric;

a pad,

means engaged with said open mesh of said fabric and extending therethrough for attaching said pad to said covering,



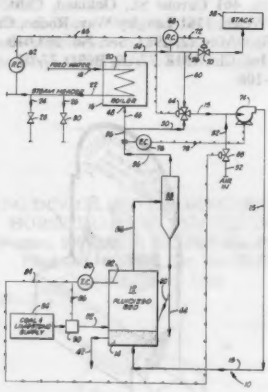
whereby said pad is capable of being attached to said fabric at substantially any position along said body of said animal.

4,355,601

RECIRCULATING FLUE GAS FLUIDIZED BED HEATER

Uday S. Hattiangadi, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Sep. 25, 1981, Ser. No. 305,755
Int. Cl.³ F22B *1/02*
U.S. Cl. 122—4 D **20 Claims**



1. A method of operating a fluidized bed heater, said method comprising the steps of:
(a) fluidizing a particulate bed by injecting a stream of fluidizing gas into said bed;
(b) charging fuel into said fluidized particulate bed;
(c) burning said fuel in said fluidized particulate bed;
(d) extracting a high temperature flue gas stream from said fluidized particulate bed;
(e) directing to a heat exchanger means a first portion of said high temperature flue gas stream;
(f) transferring heat energy from said first portion of said high temperature flue gas stream in said heat exchanger means;
(g) recycling a second portion of said high temperature flue gas stream to said fluidizing gas stream and thus to said fluidized particulate bed;
(h) adding a stream of combustion gas to said fluidizing gas stream and thus to said fluidized particulate bed;
(i) directing a first portion of a low temperature flue gas stream exiting said heat exchanger means to an exhaust stack; and
(j) recycling a second portion of said low temperature flue gas stream to said fluidizing gas stream and thus to said fluidized particulate bed.

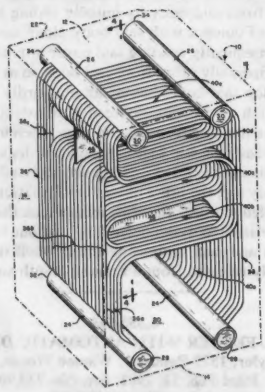
12. A fluidized bed heater system comprising:
a fluidized particulate bed;
first conduit means for injecting a stream of fluidizing gas into said fluidized particulate bed;
charge means for charging fuel into said fluidized particulate bed;
second conduit means for extracting a high temperature flue gas stream from said fluidized particulate bed;
heat transfer means for transferring heat energy from said high temperature flue gas stream;
third conduit means for directing a first portion of said high temperature flue gas stream from said second conduit means to said heat transfer means;
fourth conduit means for recycling a second portion of said high temperature flue gas stream from said second conduit means to said first conduit means;
fifth conduit means for directing a stream of combustion gas to said first conduit means;
sixth conduit means for extracting a low temperature flue gas steam from said heat transfer means;
seventh conduit means for directing a first portion of said low temperature flue gas stream from said sixth conduit means to an exhaust stack; and
eighth conduit means for recycling a secong portion of said low temperature flue gas stream from said sixth conduit means to said first conduit means.

4,355,602

BOILER

George Cooke, Willowdale, Canada, assignor to Cedar Dunes Investments Ltd., Ontario, Canada

Filed Aug. 10, 1981, Ser. No. 291,693
Int. Cl.³ F22B *15/00, 7/00*
U.S. Cl. 122—235 R **5 Claims**



1. A boiler comprising a housing having a top provided with a gas outlet, bottom, left and right sides and a front and back, the housing containing an upper manifold and a lower manifold substantially parallel to the top, bottom and side walls, two sets of tubes, each set comprising a plurality of tubes, one set joining the upper manifold to the lower manifold on the left and the other set joining the upper manifold to the lower manifold on the right, the tubes of each set rising from the lower manifold upwardly along their respective side wall, crossing the housing to the opposite side wall, rising adjacent the opposite side wall, re-crossing the housing to their respective side wall, rising therealong and eventually joining the upper manifold, the horizontal runs of the tubes of one set being vertically offset relative to the horizontal runs of the tubes of the other set so as to form a plurality of superposed chambers, individual tubes of the sets being differently bent so as to form access openings from each chamber to the chambers above and below, the openings from chamber to chamber

being offset so as to require a gas flowing through said chambers to traverse one chamber from front to back and the next chamber from back to front, means for introducing liquid into one of the manifolds and for withdrawing the liquid from the other manifold, and means for introducing a hot gas into the lowermost of the superposed chambers, the hot gas rising successively through the chambers which it successively and alternately traverses from front to back and then from back to front until it exits from the uppermost chamber through the gas outlet in the top, liquid flowing through the manifolds and tubes being heated by the hot gas, at least one baffle within at least one of the chambers extending from top to bottom and from one of the sides toward but terminating short of the other, whereby hot gas traversing that chamber from front to back is additionally forced to flow laterally to get around said baffle.

4,355,603

INTERNAL COMBUSTION ENGINE

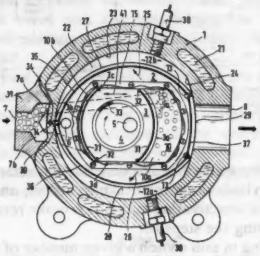
Freder Stuckenbrok, Roennelstrasse 87, 2933 Jade 2, and August Stuckenbrok, Gewerbegehiet, 2948 1 Schortens, both of Fed. Rep. of Germany

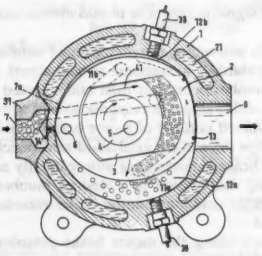
Filed Jan. 28, 1980, Ser. No. 116,063

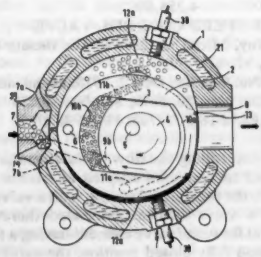
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1979, 2909715

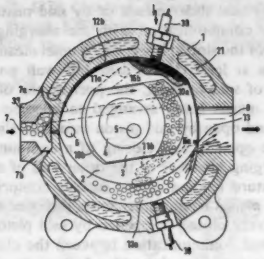
Int. Cl.³ F02B *53/00*

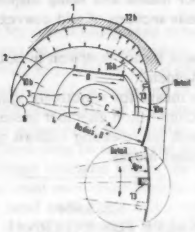
U.S. Cl. 123—18 R **6 Claims**











1. Internal combustion engine including piston means of the type having a convexly rounded peripheral portion and two generally flat face portions spaced from and generally parallel with each other and generally perpendicular to said rounded peripheral portion;

(a) said piston means being arranged for movement within a housing formed in an engine block;

(b) said piston means including first seal means slidably engaging a part of an interior wall of said housing to thus define therewith combustion chamber means limited by a part of said peripheral portion;

(c) said piston means being arranged for oscillating movement about a first axis generally perpendicular to said face portions, disposed adjacent a section of said peripheral portion and arranged near a section of interior wall portion of said housing;

(d) said piston means having an elongate slot open at both face portions of the piston means, said slot having two straight, parallel side walls generally perpendicular to said face portions, and two end walls, one disposed near the first axis, the other remote from said first axis;

(e) slide means disposed for reciprocating movement within said slot between said end walls;

(f) second seal means operatively associated with said slide means, with said piston means and with said housing to define a charging chamber at each end of the slot, each charging chamber being limited by said second seal means, by respective portions of said side walls of the slot, by a respective end wall of the slide and by adjacent part of the interior wall portion of said housing;

(g) output shaft means parallel with said first axis and including an eccentric rotatably engaging said slide means, whereby the combination of said oscillating movement of said piston means and of said reciprocating movement of said slide means is transformed into rotary movement of said output shaft means;

(h) fuel mixture feeding means for feeding fuel mixture into said combustion chamber means and including first channel means having port means coincident with at least one

of said end wall portions of the interior of said housing, said port means being disposed such as to be alternatively closed by said slider means or by said piston means and open for communication with the charging chamber at one end of the slot, and second channel means having port means in at least one of said end wall portions of the interior of said housing, the port means of said second channel means being arranged to become alternatively closed and open by said piston means or slide means for selective opening and closing of a communication with the charging chamber at the other end of said slot, said fuel mixture feeding means further comprising transfer channel means having inlet ports disposed such as to be alternatively closed or opened by said piston means, for interrupted communication between the charging chamber at one end of the slot with a first combustion chamber, and between the charging chamber at the other end of the slot with a second combustion chamber,

said first and second combustion chambers forming said combustion chamber means and being disposed one at each of mutually opposite sections of said convexly rounded peripheral portion,

whereby said piston means is driven in both directions of the oscillating movement;

(i) fuel ignition means for selectively igniting said fuel mixture in said combustion chamber means; and

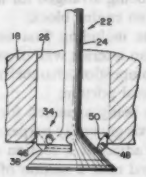
(j) exhaust means for releasing exhaust gas from said combustion chamber means.

4,355,604

SHROUDED VALVE FOR INTERNAL COMBUSTION ENGINE

Sampao Chaibongsai, 33278 Linsdale Ct., Sterling Heights, Mich. 48077

Filed May 27, 1980, Ser. No. 153,039
Int. Cl.³ F01L *3/06*
U.S. Cl. 123—188 VA **16 Claims**



1. A valve shroud for an internal combustion engine intake valve having a cylinder block formed with a cylinder bore slidably receiving a piston therein, a cylinder head closing the bore and, together with the upper surface of the piston, defining combustion chamber means therebetween; an intake valve through which a combustible charge is introduced from induction passage means into the combustion chamber, the intake valve including a stem portion and a head portion interconnected by a face portion; the valve shroud comprising:

a collar having a generally cylindrical configuration;

said collar having centrally located bore means defining an inner annular surface portion establishing sealing contact with the valve face portion;

said collar centrally located bore means including a surface portion having a convex air foil cross-section taken through the axis of rotation of said collar;

means securing said collar on the intake valve with said annular surface portion in sealing contact with said valve face portion;

said collar having port means extending through said convex surface portion for providing communication between the induction passage means and the combustion chamber means during the opening of the intake valve and for increasing the efficiency of the charge flowing through said port means; and

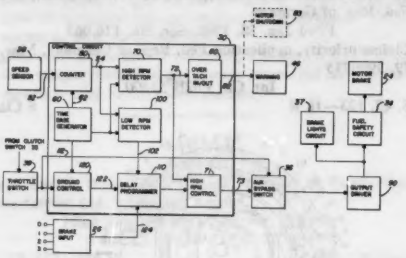
said collar characterized in that said port means have an axis generally perpendicular to said stem and said port means divide all of the entering charge from the induction passage means into a plurality of jet-like flows entering the combustion chamber means, such that turbulence of the charge is intensified providing rapid and complete combustion of the charge.

4,355,605

MOTOR BRAKE CONTROL METHOD

Charles E. Robinson, Livermore, Colo. 80536, and Melvin Nieberger, Ft. Collins, Colo., assignors to Charles E. Robinson, Livermore, Colo.

Division of Ser. No. 691,724, Jun. 1, 1976, Pat. No. 4,223,649. This application Nov. 28, 1978, Ser. No. 964,282
Int. Cl.³ F02D *17/00, 13/04, 17/01*
U.S. Cl. 123—320 **5 Claims**



1. A method for activating and deactivating retardation in a motor having cylinders, motor brake retarders, and a switch for activating and deactivating said motor brake retarders, said method comprising the steps of:

manually selecting in said switch a given number of said motor brake retarders to be activated,

automatically activating a selected number of said motor brake retarders in response to said manual selection and comprising the steps of:

(a) generating a signal in response to said manual selection in said switch,

(b) automatically activating a predetermined number of said motor brake retarders in response to said signal, said predetermined number being less than said selected number,

(c) generating a delay signal in response to said activation of said predetermined number of motor brake retarders, and

(d) repeating steps (b) and (c) until all of said selected number of motor brake retarders are automatically activated,

manually switching said switch to a desired number of said selected number of activated motor brake retarders to be deactivated, and

automatically deactivating the motor brake retarders corresponding to said desired number.

4,355,606

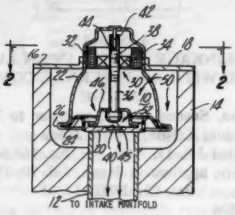
IDLE SPEED CONTROL VALVE

Gary L. Casey, Troy, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Division of Ser. No. 947,909, Oct. 2, 1978, abandoned. This application Nov. 30, 1979, Ser. No. 99,230
Int. Cl.³ F16K *31/128;* F02M *3/00*
U.S. Cl. 123—327 **1 Claim**

1. A method of controlling the flow of fluid from a pressurized source of fluid to a volume adapted to have a reduced pressure relative to the pressurized source with a valve having a valve seat and a valve element associated therewith for controlling the fluid flow, the valve element having a first fully opened and a second fully closed position, the valve element

having a pilot valve seat formed therein, a pilot valve member mateable with the pilot valve seat, and an actuator connected to the pilot valve member, the method for fixing the position of the valve element at a position intermediate the first and second position irrespective of the magnitude of the pressure of the pressurized source or the reduced pressure, comprising the steps of: operating an actuating means for moving the actuator to move the pilot valve member away from the pilot valve seat to an intermediate incremented position, wherein said actuating means comprises a rotor member for rotating the actuator in one direction to axially increment the actuator progressively



away from the valve seat and rotating the actuator in an opposite direction to axially increment the actuator progressively toward the valve seat and maintaining the actuator at the incremented position of the valve element in the absence of rotation; and

then moving the valve element away from the valve seat to an intermediate position, with the pressurized source and reduced pressure acting on said valve element whereby said intermediate position of the valve element being correlated with the incremented position of the pilot valve irrespective of the magnitude of the pressure of the pressurized source or the reduced pressure.

4,355,607

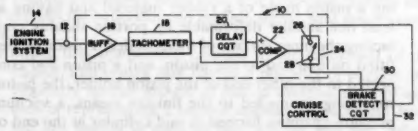
SAFETY DISENGAGEMENT DEVICE FOR AUTOMOTIVE SPEED CONTROL SYSTEM

Peter G. Blaney, Walnut Creek, Calif., assignor to Zemco, Inc., San Ramon, Calif.

Filed Sep. 8, 1980, Ser. No. 185,352

Int. Cl.³ F02B *77/08*

U.S. Cl. 123—350 **4 Claims**



1. A device for automatically disengaging a speed control system on a vehicle with an internal combustion gasoline engine having an ignition system, said device comprising: (1) an input buffer circuit adapted for connection to the vehicle ignition system for isolating ignition noise; (2) a tachometer circuit connected to said buffer circuit for generating a signal proportional to the vehicle engine speed; (3) a delay circuit connected to the output of said tachometer circuit for generating a signal proportional to the engine speed but delayed in time; (4) comparator means for comapring the tachometer circuit output to the delay circuit output and for producing a trigger signal whenever the tachometer signal exceeds the delayed signal by a preselected amount; and an output switch means connected to said comparator means for controlling the operation of the vehicle speed control system, whereby, whenever the comparator means is triggered, the output switch means will cause the speed control system to disengage.

4,355,608

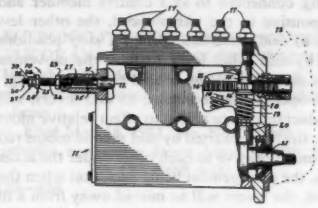
SURGE BRAKE

Earl T. Purcell, 1329 Chestnut, Clarkston, Wash. 99403, and Clifford A. Porter, 1305 Grelle, Lewiston, Id. 83501

Filed Dec. 16, 1980, Ser. No. 217,096

Int. Cl.³ F02D *31/00*

U.S. Cl. 123—364 **9 Claims**



1. A surge brake for conditioning axial movement of a throttle rod in a fuel injection pump, comprising:

a carrier bolt having an axially threaded shank adapted to be fitted to the pump, said bolt including an abutment surface at one end of the shank adapted to be located at a selected position axially adjacent to the throttle;

said carrier bolt including an open axial bore;

an elongated plunger received within the axial bore of the carrier bolt for axial movement therein, said plunger having a plunger head at one end and a remaining end, the plunger head extending axially beyond the carrier bolt abutment surface and adapted to axially engage the throttle rod;

biasing means operably engaged between the plunger and carrier bolt for yieldably resisting axial movement of the plunger head toward the carrier bolt abutment surface; and

axial adjustment means on the plunger for selectively limiting the extension of said plunger head beyond said carrier bolt abutment surface and adapted to vary resistance of the biasing means to axial motion of the plunger head toward the carrier bolt abutment surface independently of the axial position of the carrier bolt in relation to the throttle rod.

4,355,609

LIQUID FUEL PUMPING APPARATUS

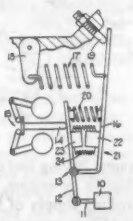
Robert T. J. Skinner, High Wycombe, England, assignor to Lucas Industries Limited, Birmingham, England

Filed May 12, 1980, Ser. No. 148,680

Claims priority, application United Kingdom, Jun. 26, 1979, 7922172

Int. Cl.³ F02M *59/42*; F02D *1/09*

U.S. Cl. 123—373 **6 Claims**



1. A liquid fuel pumping apparatus for supplying fuel to an internal combustion engine and of the kind comprising a fuel pump having a quantity control member movable in one direc-

tion to increase the amount of fuel supplied by the pump and in the other direction to reduce the amount of fuel supplied by the pump, first means responsive to the speed of operation of the pump for effecting movement of the member in said other direction, a governor spring acting in opposition to said means, manually operable means for varying the force exerted by the governor spring, a pair of levers pivotally mounted about a common axis and movable relative to each other, one of said levers being connected to said control member and to said means responsive to the pump speed, the other lever being connected to said governor spring, a stop positioned to be contacted by said other lever to limit the movement of the other lever under the action of said governor spring, and second means operatively connected to said levers, said second means producing a force acting to effect relative movement of said levers, the force exerted by said second means reducing as the levers move relative to each other under the action of said first means, the arrangement being such that when the apparatus is at rest, the levers will be moved away from a fixed relative position by the second means so that said one lever can move the control member to a position in which an excess of fuel is supplied and as the engine speed increases following starting of the engine, the levers will be moved relative to each other, to said fixed relative position and will be retained in said position by the action of the first means even when the engine speed subsequently falls to its idling value, said second means causing relative movement of said levers only in the event that the engine is stopped.

4,355,610
SERVO BOOSTED GOVERNOR CONTROL FOR ENGINES

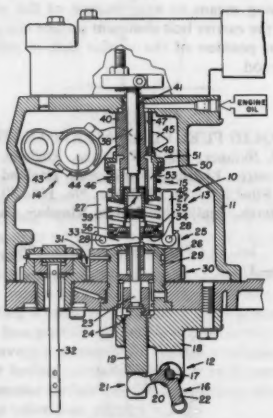
John H. Parks; Charles E. Alstrin, and Dennis M. King, all of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US80/00338, § 371 Date Mar. 28, 1980, § 102(e) Date Mar. 28, 1980, PCT Pub. No. WO81/02763, PCT Pub. Date Oct. 1, 1981

PCT Filed Mar. 28, 1980, Ser. No. 211,531

Int. Cl.³ F02D *7/00*

U.S. Cl. 123—386 **26 Claims**



1. In a fuel control system having fuel control means **(12)** for controlling supply of fuel to an engine, governor means **(13)** for automatically controlling supply of fuel to said engine by said fuel control means **(12)** in response to the speed of said engine, operator input means **(14)** for selectively applying a first force to said governor means **(13)** to oppose a counteracting force thereof, and booster means **(15,15*a*)** for applying a second force to said governor means **(13)**, additive to said first force, to aid said operator input means **(14)** in controlling said governor means **(13)**, the improvement comprising

said booster means **(15,15*a*)** including an actuating chamber **(53,53*a*)**, control means **(51,51*a*)** for continuously maintaining a predetermined fluid pressure in said actuating chamber **(53,53*a*)** in a predetermined ratio to said first force and when said operator input means **(14)** is moved to a predetermined position, and

vent means **(49,49*a*,58)** for venting fluid pressure from said actuating chamber **(53,53*a*)** when the speed of said engine is in a first speed range and for closing when the speed of said engine exceeds said speed range.

4,355,611
THROTTLE LINKAGE SYSTEM IN AN AUTOMOBILE PROVIDED WITH AN INTERNAL COMBUSTION ENGINE

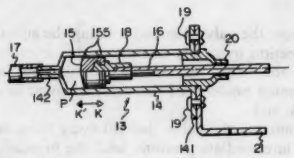
Akira Hasegawa, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 11, 1980, Ser. No. 168,640

Claims priority, application Japan, Jul. 19, 1979, 54-90913

Int. Cl.³ F02D *11/08*

U.S. Cl. 123—396 **5 Claims**



1. An apparatus for transmitting movement of the accelerator pedal of an automobile to the throttle valve arranged in an intake system of an internal combustion engine of the automobile, said apparatus comprising:

linkage means connecting the accelerator pedal with the throttle valve for transmitting movement of the accelerator pedal to the throttle valve, which movement turns the throttle valve;

spring means co-operating with the linkage means for urging the accelerator pedal to move toward a position wherein the throttle valve is in its idle position;

a damper comprising a cylinder and a piston member arranged in the cylinder, said piston member comprising a piston made of a rubber material and having at least one annular deformable lip portion slidably contacting the inner surface of the cylinder, a piston holder fitted on one end to the piston, and a piston rod connected to the other end of the piston holder, the piston rod being connected to the linkage means, a vacuum pressure chamber formed in said cylinder at the end of the piston opposite said piston holder and means for connecting said chamber to a vacuum source for urging said piston into a position for closing said throttle valve.

4,355,612
COOLING SYSTEM WITH REMOVABLE VALVE MEMBER

Heinrich E. Luksch, Kenosha, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

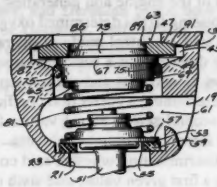
Filed Feb. 6, 1981, Ser. No. 231,982

Int. Cl.³ F01D *7/16*

U.S. Cl. 123—41.08 **24 Claims**

1. An engine cooling system comprising an engine block including an exterior surface, first wall means in said engine block defining a coolant jacket including an upstream coolant jacket portion, a downstream coolant jacket portion, and a passage portion extending between said upstream portion and

said downstream portion and including therein a valve seat, second wall means in said engine block defining a void opening into said exterior surface of said block and communicating with said coolant jacket in general alignment with said passage portion, third wall means in said engine block defining a recess opening into said exterior surface of said block and communicating with said void, a valve member engaging said seat, a



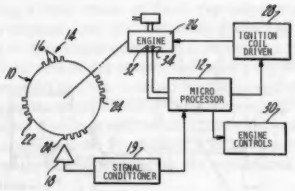
spring having a first end engaging said valve member and having a second end, a plug located in said void, and having a surface engaging said second spring end, and an outer surface, and a non-deformable retainer located in said recess and engaging said outer plug surface to releasably retain said retainer in said recess and to releasably retain said valve member against movement away from said seat.

4,355,613

IGNITION ADVANCE TIMING SYSTEM

Melvin A. Rode, West Bloomfield, and Alvin D. Toelle, Fenton, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Dec. 29, 1980, Ser. No. 221,139
Int. Cl.³ F02P *5/04*
U.S. Cl. 123—414 **7 Claims**



1. An ignition advance timing system for internal combustion engines combining angle-base and time-base ignition timing systems for generating an ignition signal, said system comprising:

a timing disk operatively coupled to the crankshaft of the engine, said timing disk having a plurality of equally and angularly spaced groups of indicia thereon, each of said indicia representing a known angular displacement from the last indicia in each of said groups, said last indicia representing zero degrees advance in ignition timing for one of the cylinders of the engine;

sensing means responsive to each of said indicia for generating an electrical signal;

a plurality of engine operating parameter sensors each operable for generating electrical signals indicating an engine operating condition;

a microcomputer means having a stored program therein responsive to said engine operating parameter signals for calculating ignition advance timing for each cylinder during a computing period initiated by said last indicia of the preceding group of indicia for calculating the ingition advance timing for such cylinder;

said microcomputer means further including means responsive to each of said indicia for generating an INTERRUPT signal to said mirocomputer means and operable to compare the known angular displacement of said indicia with said calculated ignition advance timing signal for determination if said advance timing signal is within the angular displacement before the next adjacent indicia and generate a comparison signal therefrom; and

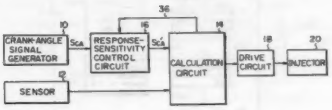
timing means responsive to said comparison signal and said calculated ignition advance timing signal for generating an interval at the end of which an ignition signal at the calculated advance between adjacent indicia is generated.

4,355,614

ELECTRONIC FUEL INJECTION CONTROL APPARATUS OF AN INTERNAL COMBUSTION ENGINE

Kunihisa Hayashi, and Masakazu Moriyama, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 14, 1981, Ser. No. 263,468
Claims priority, application Japan, May 16, 1980, 55-064030
Int. Cl.³ F02B *3/00*
U.S. Cl. 123—436 **6 Claims**



1. An electronic fuel injection control apparatus of an internal combustion engine having a crankshaft, said apparatus comprising:

means for generating a first electrical signal at every crankshaft rotation of a predetermined angle;

means for generating a second electrical signal having a level which corresponds to a varying quantity in the period of said first electrical signal;

means, in response to said first electrical signal, for generating a third electrical signal having a variable period, a varying quantity of said third electrical signal period being maintained at a constant value or constant values irrespective of the varying quantity of said first electrical signal period when said second electrical signal is smaller than or equal to a predetermined value, a varying quantity of said third electrical signal period being changed in response to the varying quantity of said first electrical signal period when said second electrical signal is greater than the predetermined value; and

means for adjusting the amount of fuel injected into the engine, in response to the period of said third electrical signal.

4,355,615

AIR/FUEL RATIO CONTROL DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Masaharu Asano, Yokosuka; Shoji Furuhashi, and Hideyuki Tamura, both of Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 2, 1980, Ser. No. 145,987
Claims priority, application Japan, May 4, 1979, 54-54061
Int. Cl.³ F02B *3/08, 33/00, 3/00*; F02D *3/04*
U.S. Cl. 123—437 **20 Claims**

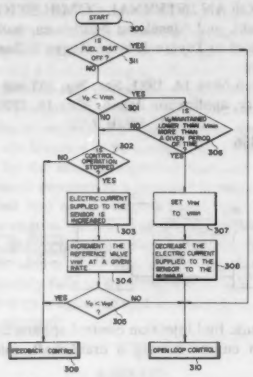
1. An air/fuel control device for an internal combustion engine having a fuel supply comprising:

an exhaust gas sensor provided in an exhaust gas passage of said internal combustion engine for determining an exhaust gas component concentration and for generating a sensor signal indicative of the determined concentration;

a discriminating circuit for comparing said sensor signal value with a first reference value and determining if said exhaust gas sensor temperature condition satisfies a feedback control condition, said discriminating circuit producing a switching signal when said feedback control condition is satisfied;

a control circuit, responsive to said switching signal, for effecting feedback control operation and open loop control operation selectively, said control circuit feedback controlling said fuel supply and producing a control signal indicative of a determined fuel rate, said control circuit resetting said first reference value to a minimum value when control operation mode is switched from feedback control to open loop control; and

an electric power supply control circuit for controlling an electric current supplied to said exhaust gas sensor, said



power supply control circuit including a switching means for adjusting the electric current value, said switching means having first means for comparing said sensor signal value with a minimum value for determining the sensor condition, second means for measuring a period of time during which said first means determines said sensor signal value is lower than said minimum value and a third means for supplying a minimum value of electric current when said second means determining said sensor is not in a condition to effect feedback control.

4,355,616

FUEL SUPPLY CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE OF AN AUTOMOTIVE VEHICLE

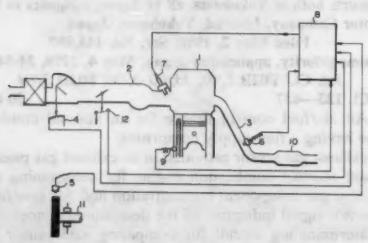
Hideyuki Tamura, Yokohama, and Kenji Ikeura, Yokosuka, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 14, 1980, Ser. No. 149,144

Claims priority, application Japan, May 15, 1979, 54-58681

Int. Cl.³ F02B *3/00*

U.S. Cl. 123—440 **18 Claims**



1. A fuel supply control system for an internal combustion engine having open loop and λ-control modes of operation comprising:

first sensor means for determining the air flow rate flowing through an air intake passage of said engine and generating a first sensor signal indicative of the determined air flow rate;

second sensor means for determining engine speed and generating a second sensor signal corresponding to the determined engine speed;

third sensor means for determining oxygen concentration in an exhaust gas of the engine and generating a third sensor signal corresponding to the determined oxygen concentration for use in said λ-control mode of operation;

fourth means for determining a basic fuel injection amount based on values of said first and second sensor signals;

fifth means for determining a correction coefficient based on said first and second sensor signal values for correcting said basic fuel injection amount; and

sixth means for discriminating whether said correction coefficient exceeds a first given value, said sixth means responsive to said fifth means for clamping λ-control when said correction coefficient exceeds said first given value and subsequently carrying out open loop control.

4,355,617

FUEL INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINES WITH CONTINUOUS INJECTION IN THE INTAKE PIPE

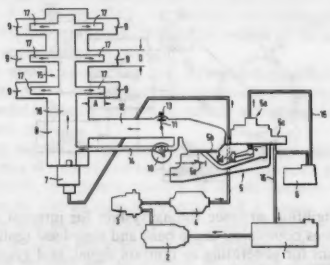
Heinz Dorsch, Weissach, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche A.G., Stuttgart, Fed. Rep. of Germany

Filed Sep. 22, 1980, Ser. No. 189,866

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1979, 2938406

Int. Cl.³ F02M *59/32*

U.S. Cl. 123—453 **6 Claims**



1. A fuel injection system for a mixture compressing, external ignition, four stroke cycle internal combustion engine with fuel injection in an intake pipe, comprising a primary intake pipe in which an air metering element and an intentionally actuated choke are arranged in succession, a plurality of intake lines for supplying an air-fuel mixture to engine cylinders, all of the intake lines and the primary intake pipe opening into a common manifold intake pipe and an electromagnetically actuated injection nozzle for cold starting of the internal combustion engine, characterized in that a fuel distribution arrangement is provided within the manifold intake pipe and comprises a fuel admitting portion and fuel feed components each of which extends from said admitting portion to a corresponding one of said intake lines, wherein an air supply means bypassing said choke is provided for forcing air directly into the fuel admitting portion bypassing the choke, and wherein said injection nozzle supplies fuel into said fuel admitting portion, whereby the air from said air supply means and fuel from said injection nozzle are thoroughly mixed within said admitting portion and uniformly distributed by the fuel feed components to the respective intake lines to the engine cylinders.

4,355,618

METHOD AND APPARATUS FOR OBTAINING A CONTROL VARIABLE FOR THE CLOSED-LOOP CONTROL OF THE FUEL-AIR RATIO IN THE OPERATING MIXTURE OF INTERNAL COMBUSTION ENGINES

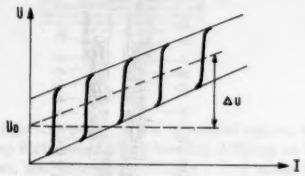
Klaus Müller, Tamm; Franz Rieger, Aalen-Wasseralfingen; Helmut Maurer, Schwieberdingen; Ernst Linder, Mühlacker; Harald Reber, and Hermann Dietz, both of Gerlingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 17, 1980, Ser. No. 207,560

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1979, 2946440

Int. Cl.³ F02B *3/00*

U.S. Cl. 123—489 **5 Claims**



1. A method for obtaining a control variable for a closed-loop control device for the closed-loop control of the fuel-air ratio of the operating mixture in internal combustion engines utilizing an exhaust gas threshold-current sensor exposed to the exhaust gas flow and a control device for adjusting the fuel-air ratio of the operating mixture, said sensor operating on the principle of oxygen ion conduction when exposed to voltage and having a body made of fixed electrolyte material which conducts oxygen ions and furnishes a control signal corresponding to the oxygen content in the exhaust gas, wherein the threshold current of the sensor, defined by the diffusion speed of the measured gas, is a standard for the oxygen content in the exhaust gas, the method comprising the steps of:

generating a voltage difference signal which corresponds to the change in the air number λ of the operating mixture when there is a change in the operational state of the engine;

generating a reference measurement voltage signal;

adding the generated voltage difference signal and the generated reference measurement voltage signal; and

applying the added generated voltage difference signal and the generated reference measurement voltage signal to the exhaust gas threshold-current sensor and measuring the resultant current through the exhaust gas threshold-current sensor, said resultant current serving as a standard for the percentage oxygen content in the closed-loop control circuit with the oxygen content which is to be maintained; whereby the closed-loop control device corrects the fuel-air ratio accordingly.

2. An apparatus for obtaining a control variable for a closed-loop control device for the closed-loop control of the fuel-air ratio of the operating mixture in internal combustion engines, comprising:

means for ascertaining the operational state of the engine;

control means connected to the means for ascertaining the operational state of the engine for generating a voltage difference signal corresponding to the change in the air number λ resulting from the ascertained change in the operational state of the engine;

an exhaust gas threshold-current sensor exposed to the flow of exhaust gas, said sensor having a fixed electrolyte body which conducts oxygen ions;

means for adding the voltage difference signal to a reference measurement voltage signal and applying the added voltage signals to the exhaust gas threshold-current sensor; and

current measuring means for measuring the resultant current through the exhaust gas threshold-current sensor as a result of applying the added voltage signals, whereby the resultant current serves as the control variable for the control device.

4,355,619

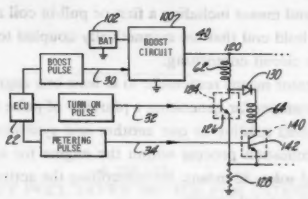
FAST RESPONSE TWO COIL SOLENOID DRIVER

John R. Wilkinson, Dearborn, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Oct. 1, 1980, Ser. No. 193,331

Int. Cl.³ F02B *3/00*; H01H *47/04*

U.S. Cl. 123—490 **16 Claims**



1. A fuel control system for an internal combustion engine comprising:

at least one fuel injector adapted to receive fuel and for injecting a determinable quantity of fuel to a cylinder of the engine, including metering chamber means for storing the determinable quantity of the received fuel prior to the injection of the fuel into the cylinder and solenoid means operatively situated relative to said metering chamber means for selectively permitting, upon activation, the received fuel to flow therein, said solenoid means including a first or pull-in coil and a second or hold coil that are magnetically coupled to each other;

generator means responsive to at least one engine operating parameter for generating a plurality of pulse train signals, phased relative to one another and synchronized to the combustion process within the engine for energizing of said solenoid means for controlling the activation time of said solenoid means and for controlling the duration of fuel flow to said metering means;

source means, including a battery, for providing a ready source of electrical energy;

boost means, responsive to a first pulsed signal of said plurality of signals for generating a first voltage greater than the voltage of said source means comprising:

a boost coil connected to said source means;

first switch means, including a first transistor, connected to said boost coil, for transferring a first quantity of electrical energy from said source means to said boost coil in response to said first pulsed signal;

first and second diodes having their cathode terminals connected in common and having the anode of said first diode connected to said source means and having the anode of said second diode connected to said boost coil at the junction of said boost coil and said first switch means;

current limiting means, including a first resistor connected to said first switch means for limiting the current flow therethrough;

second switch means, one associated with each of said at least one fuel injector, responsive to a second pulsed signal of said plurality of pulsed train signals and connected to one terminal of said pull-in coil for permitting current to flow through said pull-in coil in timed relationship with the generation of the first pulsed signal and wherein the other terminal of said pull-in coil is connected to the anode of said first diode;

a third diode, one associated with each of said at least one

fuel injector having its anode connected to said one terminal of said pull-in coil, and its cathode connected to a first terminals of said hold coil;

third switch means, one associated with each said at least one fuel injector and responsive to a third pulsed signal of said plurality of pulsed train signals and connected to a second terminal of said hold coil for activating said hold coil to maintain said solenoid means in an activated state thereby permitting continued fuel flow into said metering chamber means.

9. A circuit for activating at least one fuel injector of an internal combustion engine, the at least one fuel injector including:

solenoid means including a first or pull-in coil and a second or hold coil that are magnetically coupled to each other, the circuit comprising:

generator means responsive to at least one engine operating parameter for generating a plurality of pulse train signals, phased relative to one another and synchronized to the combustion process within the engine for energizing of said solenoid means, for controlling the activation time of said soneoid means;

source means, including a battery, for providing a ready source of electrical energy;

boost means, responsive to a first pulsed signal of said plurality of signals for generating a first voltage greater than the voltage of said source means comprising:

a boost coil connected to said source means;

first switch means, including a first transistor, connected to said boost coil, for transferring a first quantity of electrical energy from said source means to said boost coil in response to said first pulsed signal;

first and second diodes having their cathode terminals connected in common and having the anode of said first diode connected to said source means and having the anode of said second diode connected to said boost coil at the junction of said boost coil and said first switch means;

current limiting means, including a first resistor connected to said first switch means for limiting the current flow therethrough;

second switch means, one associated with each of said at least one fuel injector, responsive to a second pulsed signal of said plurality of pulsed train signals and connected to one terminal of said pull-in coil for permitting current to flow through said pull-in coil in timed relationship with the generation of the first pulsed signal and wherein the other terminal of said pull-in coil is connected to the anode of said first diode;

a third diode, one associated with each said at least one fuel injector having its anode connected to said one terminal of said pull-in coil, and its cathode connected to a first terminal of said hold coil;

third switch means, one associated with each said at least one fuel injector and responsive to a third pulsed signal of said plurality of pulsed train signals and connected to a second terminal of said hold coil for activating said hold coil to maintain said solenoid means in an activated state thereby permitting continued fuel flow into said metering chamber means.

4,355,620

FUEL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

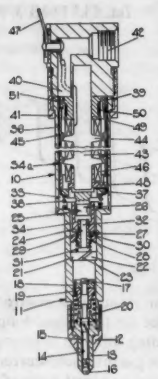
Alec H. Seilly, North Wembley; Dorian F. Mowbray, Burnham; John E. Mardell, Uxbridge, and Michael J. Davison, London, all of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Nov. 16, 1979, Ser. No. 94,720

Claims priority, application United Kingdom, Feb. 8, 1979, 7904536; Mar. 3, 1979, 7907556

Int. Cl.³ F02M 51/04

U.S. Cl. 123—499 10 Claims



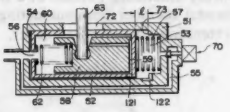
1. A fuel system for an internal combustion engine of the type in which fuel is injected into a combustion space of the engine, the system comprising an injection nozzle positioned on the engine so that fuel delivered to the nozzle will be injected into the combustion space, an injection pump for delivering fuel to the nozzle in timed relationship with the associated engine, said pump comprising a piston movable in a bore to vary the size of a pumping chamber, resilient means biasing the piston in a direction to increase the size of the pumping chamber, electromagnetic means operable to move the piston against the action of the resilient means to displace fuel from the pumping chamber through the associated nozzle, a valve controlled fuel inlet to said pumping chamber and through which fuel can flow into the bore from a source of fuel when the piston is moved by the action of the resilient means, the system including first electronic means for supplying power to the electromagnetic means when delivery of fuel by the pump is required, second electronic means for providing a first control signal to said first electronic means when it is desired to energize the electromagnetic means, third electronic means for providing a second control signal to said first electronic means to cut off the supply of power to said electromagnetic means thereby to allow fuel to flow into the pumping chamber, said third electronic means being operative to determine from signals supplied to it, the time required for the pumping chamber to fill with the desired quantity of fuel thereby to determine the instant the second control signal is supplied, fourth electronic means for determining the desired amount of fuel to be supplied to the engine and fifth electronic means for determining the desired timing of delivery of fuel, the signals provided by said fourth and fifth electronic means being supplied to said third electronic means, and said fifth electronic means comprising a store in which is stored information regarding the required timing of delivery of fuel for different engine speeds and load, said fifth electronic means receiving a signal from said fourth electronic means and also a signal indicative of the speed of the associated engine.

4,355,621

INJECTION ADVANCE DEVICE

Seishi Yasuhara, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 30, 1980, Ser. No. 145,155
Claims priority, application Japan, May 1, 1979, 54-53602; Sep. 3, 1979, 54-112590; Sep. 3, 1979, 54-112591
Int. Cl.³ L02M *39/00*; F02M *39/00*; F02D *1/16*
U.S. Cl. 123—502 13 Claims



1. In a fuel injection pump for use in a diesel engine, said fuel injection pump including a pump housing defining an interior pump chamber, said housing containing a feed pump for supplying fuel under pressure substantially proportionally to engine speed to said pump chamber, and a fuel-injection timing control member movable to determine a fuel-injection timing corresponding to its position, an injection advance device comprising:

(a) a casing fixed to said pump housing;

(b) a cylinder slidably located in said casing to form first and second chambers at the respective ends of said cylinder, said first chamber being in communication with said feed pump inlet side and said second chamber being in communication through a release passage with said feed inlet side;

(c) first spring means located in said second chamber for urging said cylinder toward said first chamber so as to advance the fuel-injection timing;

(d) a piston slidably located in said cylinder to form third and fourth chambers at the respective ends of said piston, said third chamber communicating with said feed pump inlet side, said fourth chamber communicating with said pump chamber, said piston being drivingly connected to said control member;

(e) second spring means located in said third chamber for urging said piston towards said fourth chamber; and

(f) valve means provided in said release passage for interrupting communication between said second chamber and said feed pump inlet side so as to prevent said cylinder from moving towards said second chamber in response to at least one engine operating parameter.

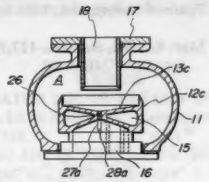
4,355,622

AIR/FUEL MIXTURE HEATING DEVICE FOR INTERNAL COMBUSTION ENGINE

Mitsumasa Inoue, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 1, 1980, Ser. No. 164,906
Claims priority, application Japan, Jul. 18, 1979, 54-99039[U]
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—548 1 Claim

1. An air/fuel mixture heating device for an internal combustion engine, arranged in an intake manifold including fuel supply means upstream of a riser space in said intake manifold, comprising: a riser extending substantially vertically into said intake manifold to a relatively high position in said riser space and having a riser surface slowly inclined downwardly toward its center substantially opposite to a carburetor outlet for introducing a fuel air mixture to the riser surface, said riser being formed at a circumference of said riser surface with a barrier for collecting condensed fuel, a hot water jacket through said riser below said riser surface for passing engine cooling water



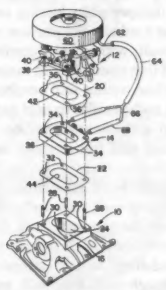
therethrough to heat condensed fuel in said barrier, and with paths through said riser for the condensed fuel.

4,355,623

AIR INLET FUEL SAVER DEVICE FOR INTERNAL COMBUSTION ENGINES

Lewis N. Graham, 1864 E. Maxwell St., Pensacola, Fla. 32503

Filed Feb. 27, 1981, Ser. No. 238,836
Int. Cl.³ F02M *23/04*
U.S. Cl. 123—585 5 Claims

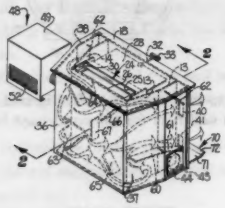


2. In combination with an internal combustion engine having an intake manifold and a carburetor with air filter for mixing fuel and air together prior to induction into the engine combustion area comprising: an auxiliary body having a throat aperture therein for alignment between and with the carburetor and intake manifold openings, at least one auxiliary air inlet hole orientated at a pre-determined angle between the auxiliary body throat aperture and the exterior thereof, valve adjusting means associated with said auxiliary air inlet hole at another predetermined angle thereto, and provided with adjusting means therein for effecting violent turbulence of air flowing through the auxiliary hole at the exit thereof in addition to creating high frequency sound vibrations therein for the purpose of increasing the homogenization of fuel-air mixture with resultant increase in engine efficiency, said adjusting means including a valve member having a rounded blunted end which projects into the exit opening of said auxiliary air inlet hole, and said adjusting means further including said valve member having a deflecting blade at the rounded blunted end extremity thereof for the purpose of effecting violent turbulence of the air being sucked through the auxiliary air inlet hole exist and also for the purpose of creating vibration sound effects.

4,355,624
FUEL BURNING HEATER

James C. Hardin, 1261 Westbrook Cir., and Gerald D. Hardin, Rte. 1, Box 523, Sparrow Springs Rd., both of Gastonia, N.C. 28052

Filed Mar. 6, 1980, Ser. No. 127,783
Int. Cl.³ F24B 3/00
U.S. Cl. 126—66 5 Claims



1. A fuel burning heater characterized as having a relatively low temperature on the top wall thereof so as to minimize warpage and deterioration of such wall, and comprising

a front wall, a back wall, opposite side walls, a bottom wall, and a top wall collectively defining an enclosed combustion chamber,

an access opening in said front wall to permit access to said combustion chamber,

a flue opening in said top wall adjacent said back wall for communicating with a flue or the like,

a relatively flat damper plate having an overall area comparable to at least a substantial portion of that part of the area of said top wall within said combustion chamber forwardly of said flue opening, and means slideably mounting said damper plate within said combustion chamber immediately below and parallel to said top wall, and for movement between a rearward position underlying and substantially closing said flue opening and a forward position wherein the damper plate is spaced forwardly of said flue opening and underlies a substantial portion of that part of the area of the top wall forwardly of said flue opening to thereby insulate the top wall from the heat of combustion within said combustion chamber, said mounting means including a rod fixed to said damper plate and extending forwardly through said front wall, and handle means fixed to said rod forwardly of said front wall.

4,355,625
FIREPLACE BOILER WITH AIR TIGHT FRONT AND CONTROLLED DRAFT

William C. Kincaid, 322 Sherwood Dr., Suffolk, Va. 23434

Filed Feb. 6, 1980, Ser. No. 77,149
Int. Cl.³ F24B 9/04
U.S. Cl. 126—132 11 Claims

1. A water-heating device adapted to be placed in a fireplace cavity having a front opening comprising

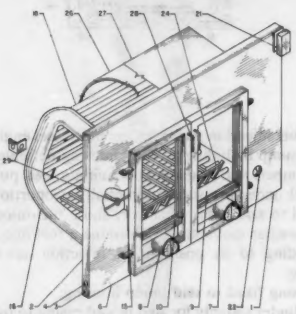
(a) a vertically disposed front steel wall of substantially rectangular periphery having front and rear surfaces and adapted to make an airtight fit with the front opening of said fireplace cavity,

(b) two substantially identical C-shaped headers disposed in upright manner in mirror image relationship adjacent each vertical side of said steel wall, each header consisting of a back portion and forwardly extending portions emerging from the upper and lower extremities of said back portion and communicating therewith, said back portions being spaced closer together than said forwardly extending portions, the forwardmost extremities of said forwardly extending portions being attached to and sealed by the rear surface of said steel wall,

(c) a plurality of horizontal tubes extending between said headers and communicating therewith,

(d) a series of substantially parallel spaced apart bars attached to the top sides of those horizontal tubes extending between the lower forwardly extending portions of said header, and perpendicular thereto, thereby forming a grate capable of supporting combustible solid fuel,

(e) conduit means associated with the rear surface of said steel plate adjacent the outer periphery thereof, said conduit means comprising upper and lower horizontal members and opposed side members, said upper and side members being continuous and in communication with an upper forwardly extending portion of a header, and said lower horizontal member communicating with a lower forwardly extending portion of a header,



(f) means associated with said lower horizontal member of said conduit means to permit ingress of water to be heated,

(g) means associated with said conduit means, above the means permitting ingress of water, to permit removal of heated water,

(h) means for sensing the temperature of water within said conduit means adjacent the upper portion of said steel plate,

(i) first baffle means disposed at the rear of said device and behind said horizontal tubes adapted to reflect heat toward said grate, and

(j) a hinged door substantially centered within said steel plate adapted to admit solid fuel to said grate.

4,355,626
STOVE HAVING EXTRUDED DOOR OPENING AND METHOD OF MAKING SAME

Charles L. Bailey, Homer, and Roy D. Baker, Brooklyn, both of Mich., assignors to Eagle-Picher Industries, Inc., Cincinnati, Ohio

Division of Ser. No. 163,923, Jun. 30, 1980, abandoned. This application Jul. 30, 1981, Ser. No. 288,310
Int. Cl.³ F23M 7/00
U.S. Cl. 126—190 9 Claims

1. Door and door opening structure for wood-burning stove, the door opening structure comprising,

a stove front plate having a fueling opening in it,

a door flange projecting fowardly around the opening, the flange being integral with the plate, there being a round corner where the flange joins the plate;

the flange having an inturned lip at its outer edge,

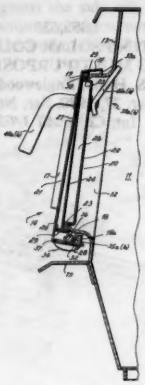
the door comprising,

an outer plate, an inner plate, and a shim plate, said shim plate being connected between the outer and inner plates and providing spacing between them,

wherein said spacing increases from the top to the bottom of said inner and outer plate, and

wherein said shim plate at an upper edge portion thereof adjoins the outer plate and at a lower edge portion thereof

has an outwardly turned lip mounted to said outer plate and which angulates said shim plate with respect to the outer plate, there by defining said spacing between the inner and outer plates,



said inner plate being mounted to said shim plate and being angulated by the shim plate with respect to said outer plate.

4,355,627

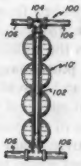
THERMAL STORAGE SYSTEM

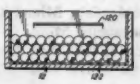
Robert W. Scarlata, 913 Heritage Rd., Moorestown, N.J. 08057

Continuation-in-part of Ser. No. 912,961, Jun. 6, 1978, Pat. No. 4,205,656. This application May 29, 1980, Ser. No. 154,575

Int. Cl.³ F24H *7/00;* **F24J** *3/02*

U.S. Cl. 126—400 **10 Claims**





1. A thermal storage system for use with a circulating fluid that is passed through the thermal storage system for exchange of energy between the fluid and the system, wherein the system comprises:

(a) a storage bin having means associated therewith for, in use, receiving and discharging the circulating fluid;

(b) a plurality of discrete heat storage reservoirs within said bin, each having a shell of regular sphere-like geometric shape defining an interior cavity within the reservoir and defining a substantially diametric passageway through the sphere-like shell;

(c) an elongated carrying member in said bin having a plurality of said reservoirs engaged thereon through said passageway; and

(d) heat storage media contained within said cavity, the shell conducting heat between the fluid and the heat storage media.

4,355,628

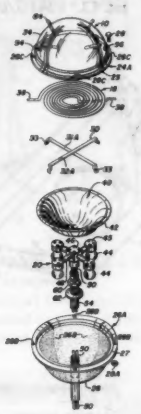
ILLUMINATED SOLAR ENERGY COLLECTOR

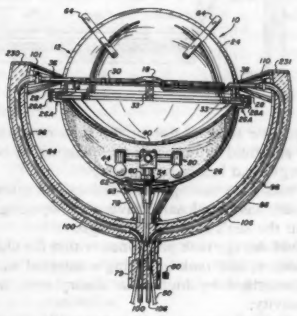
Ralph M. Watts, Little Rock, Ark., assignor to John W. Lowery, Jacksonville, Ark.

Filed Jan. 29, 1982, Ser. No. 343,780

Int. Cl.³ F24J *3/02;* **F21V** *33/00*

U.S. Cl. 126—427 **5 Claims**





1. An illuminated solar energy collection unit comprising:

a generally spherical collector adapted to be exposed to sunlight, said collector comprising upper and lower generally hemispherically shaped, flanged halves adapted to be coupled together;

heat exchange means disposed within said spherical collector substantially at the center thereof for warming fluid passing therethrough with solar energy, said heat exchange means including fluid input means and fluid output means;

means for supporting said heat exchange means within said collector, said supporting means including at least a portion thereof secured between said flanged collector halves;

mirror means disposed within said collector for reflecting solar energy toward said heat exchange means;

lighting means disposed interiorly of said collector for selectively providing illumination, said lighting means disposed

between said mirror means and a lowermost portion of said collector whereby heat generated by said lighting means will warm the collection unit thereby resisting build-up of the moisture and accumulation of snow, ice and the like; and,

pedestal means adapted to be disposed upon a supporting surface for securely mounting said collector at an elevated position above said surface.

4,355,629

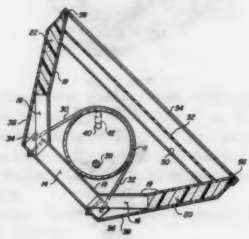
SUPERIOR PERFORMANCE PASSIVE SOLAR WATER HEATER

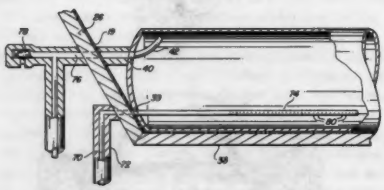
S. Douglas Cornell, III, 911 S. Marvin Ave., Tucson, Ariz. 85710

Filed Nov. 24, 1980, Ser. No. 209,756

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—437 **3 Claims**





1. A passive solar heater of the type combining the heat absorber and fluid storage in a tank adapted to be exposed to solar energy, said heater comprising:

(a) an enclosure having walls defining an interior chamber therein, said enclosure having an opening adapted to admit the sun's rays therethrough;

(b) a fluid storage tank positioned within the chamber in said enclosure, said tank including a selected surface coating characterized by high heat absorptance and low heat emissivity;

(c) insulative lining on the interior walls of said enclosure, said insulative lining including a sun reflective foil surface lining the inside walls of said insulative material so aligned to reflect the sun's rays impinging on the foil and redirect the rays toward the said tank;

(d) tank support means connecting the tank to the enclosure, said tank support means including intermediate insulative means adapted to receive and hold said supports in fixed, non-contact arrangement with the enclosure;

(e) said supports including a selected coating characterized by high heat absorptance and low heat emissivity;

(f) multiple glazings extending across said opening in said enclosure, said glazings being spaced apart and extending to said insulative lining, said glazings being secured at the inner side of said enclosure side wall at said lining with nonconductive air sealant being interposed between said glazing edges and said insulative material lining whereby the opening of the enclosure is made substantially air-tight; and

(g) means to interrupt the heat conduction path along the sun reflective foil from the inside of the enclosure, said means including scribing in said sun reflective foil proximate to each glazing, said scribing extending through the foil and being covered by non-heat-conductive sealant.

4,355,630

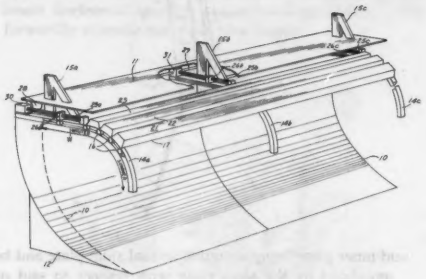
CONCENTRATING SOLAR COLLECTOR WITH TRACKING MULTIPURPOSE TARGETS

Arthur Fattor, 5380 S. Holly, Englewood, Colo. 80111

Filed Mar. 27, 1980, Ser. No. 134,702

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—438 **8 Claims**



1. A solar energy collector comprising:

(a) a reflective surface means positioned so as to be nonmovable and having such a curvature as to produce a line focus of solar radiation at any incident angle of the sun's rays,

(b) plural collector target means mounted above said reflective surface means in a plurality of substantially separate housings, any one of such target means being capable of being positioned to accept a line focus, and each target means being capable of generating a distinct form of energy as distinguished from the other target means,

(c) plural track means having a concave, reverse curvature with respect to the reflective surface means, on which is mounted said plural target means over said reflective surface means and providing a path of movement for said target means to intercept maximum solar reflected flux at various seasons of the year,

(d) means for moving said plural target means to position one of said target means in said line focus so as to energize said target means, and

(e) means for recovering a specific generated energy form from said one of said target means.

4,355,631

SURGICAL RETRACTOR APPARATUS WITH IMPROVED CLAMPING DEVICE

Bruce A. LeVahn, Robbinsdale, Minn., assignor to Minnesota Scientific, Inc., Minneapolis, Minn.

Filed Mar. 19, 1981, Ser. No. 245,378

Int. Cl.³ A61B *1/32, 17/02*

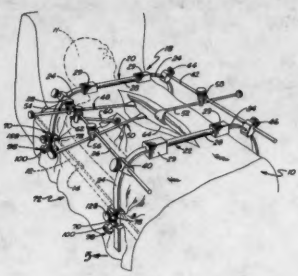
U.S. Cl. 128—20 **7 Claims**

1. A retractor apparatus for fastening to the side rails of an operating table covered by a surgical drape having a sterile and an unsterile side, said retractor apparatus including support members to be secured to the side rails and extending upwardly above the level of said operating table surgical retractors adjustably secured to said support members and, clamping devices for securing said support members to said side rails and supporting said apparatus on the sterile side of said surgical drape covering the operating table, each of said clamping devices comprising:

a first member having a first clamping portion for engaging the sterile side of the surgical drape to clamp the unsterile side of the surgical drape against the side rail and having

a first passage extending therethrough, through which one of the support members extends;

a second member pivotally attached to the first member having a second clamping portion for engaging the sterile side of the surgical drape to clamp the unsterile side of the surgical drape against the side rail, the second member pivoting to a clamping position with the first clamping member, and said second member having a second passage



extending therethrough alignable with the first passage, the support member of the retractor apparatus extending from the first passage into and through the second passage;

means for tightening the first and second clamping members into the clamping position; and

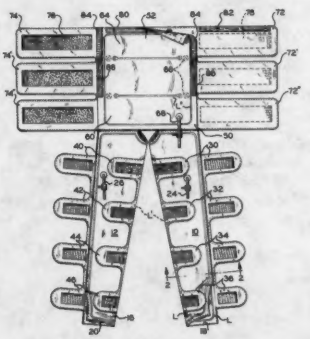
means for holding the support member of the retractor apparatus in fixed position within the first and second passages.

4,355,632

ANTI-SHOCK PRESSURE GARMENT

Terry L. Sandman, Toledo, Ohio, assignor to Jobst Institute, Inc., Toledo, Ohio

Filed Aug. 6, 1980, Ser. No. 175,733
Int. Cl.³ A61H *1/00*
U.S. Cl. 128—24 R **5 Claims**



1. An anti-shock pressure garment to cover the thorax and abdominal regions of a patient comprising:

(a) a rear flexible panel for flatwise application to the back of the patient;

(b) an inflatable front flexible panel for covering and imposing pressure on the patient's thorax and abdomen; said inflatable front panel including a plurality of horizontally disposed inflatable bladders providing vertically spaced individual sections, the uppermost section being foldable downwardly and forwardly upon itself for height adjustment, means holding said section in folded position, and means for connecting said sections to a source of pressure fluid; and

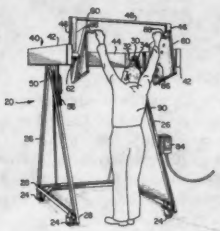
(c) fastener means for securing and maintaining said panels in operative position.

4,355,633

ADJUSTABLE MULTI-FUNCTION ROTARY EXERCISE APPARATUS

Harold Heilbrun, P.O. Box 397, Scottsbluff, Nebr. 69361

Filed Aug. 5, 1980, Ser. No. 175,471
Int. Cl.³ A61H *1/02*
U.S. Cl. 128—25 R **9 Claims**



1. An exercise apparatus for physical therapy, muscle rehabilitation and the like, comprising:

a rigid stationary support frame including a pair of substantially parallel spaced-apart A-frame side members between which a patient may stand or sit when operating the machine,

a substantially U-shaped pivotal support frame mounted on said stationary support frame medially of said pivotal frame and having means thereon for positively locking said pivotal support frame in a selectable fixed pivotal condition with respect to said stationary support frame, said pivotal support frame including first and second parallel lateral support arms each pivotally mounted at the top of a respective one of said side frame members, and cross-arm means fixedly attached between the open set of proximate ends thereof and interconnecting said support arms for forming a rigid open box for maintaining the support arms in parallel relationship for all positions of said pivotal movement,

first and second peg-support members mounted respectively on said first and second support arms for rotation about respective horizontal axes,

first and second pegs mounted respectively on said first and second peg-support members at a position spaced from said respective horizontal axes, each said peg extending in a horizontal orientation,

an electric motor having a rotary output shaft, and

mechanical drive means interconnecting said motor output shaft and each of said first and second rotary peg-support members for effecting rotation of each of the latter.

4,355,634

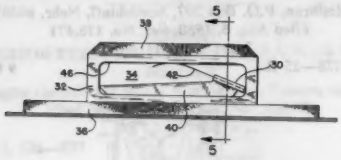
LOCATOR DEVICE FOR EXTERNAL CARDIAC COMPRESSION DURING CARDIOPULMONARY RESUSCITATION

Spencer I. Kanter, 123 Charter Rd., Wethersfield, Conn. 06109, assignor to Spencer I. Kanter, Wethersfield, Conn.

Filed Dec. 31, 1980, Ser. No. 221,538
Int. Cl.³ A61H *31/00*
U.S. Cl. 128—28 **7 Claims**

1. A disposable external cardiac compression device particularly well suited for accurate placement and retention on a patient longitudinally along the patient's lower sternum during CPR use comprising an elongated main body portion of relatively noncompressive unyielding material and top and bottom

layers of relatively softer cushion-like material on opposite sides of the main body portion along the longitudinal extent thereof, said bottom layer extending longitudinally beyond said main body member to form projecting locator flange portions, said top layer having an outer top surface of a length and width sufficient to conformably accommodate engagement by the heel of a hand placed thereon, said top surface



being spaced from the outer bottom surface of said bottom layer by the distance of at least the minimum CPR recommended compression depth, said projecting locator flange portions having a length substantially equal to the width of two fingers and being of sufficient flexibility to permit ready yielding upon application of pressure against said top surface, said bottom surface having adhesive means thereon for removably adhering the device to a patient during CPR use.

4,355,635

ADJUSTABLE ARM SLING WITH POUCH

Claudia J. Bihl, Franklin Furnace, and Michael C. Molloy, Cincinnati, both of Ohio, assignors to Jung Products, Inc., Cincinnati, Ohio

Filed Jul. 14, 1980, Ser. No. 167,772

Int. Cl.³ A61F *5/40*

U.S. Cl. 128—94 **14 Claims**

1. An adjustable arm sling consisting essentially of:

(a) a ring member adapted to be centrally disposed one the wearer's chest,

(b) a pair of elongated strap members each secured at one end to said ring member, said strap members being of a length to pass upwardly and rearwardly over the wearer's shoulders and cross diagonally downwardly across the wearer's back, the strap members passing around the opposite sides of the wearer's upper body and meeting across the front of wearer's upper body, said ring and said strap members thereby establishing a figure 8 loop configuration over the shoulders and around the torso of the wearer when said sling is worn,

(c) fastening means on the ends of said strap members for adjustably joining together their meeting ends,

(d) an arm supporting pouch, and

(e) an elongated connector tab for adjustably securing said pouch to said ring member.

4,355,636

HUMDIFIER AND HEATER FOR AIR TO BE INHALED FOR CONNECTION TO AN INHALATION CONDUIT OF A RESPIRATOR

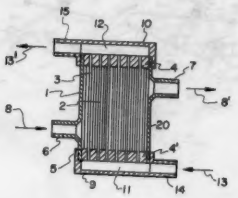
Georg-Wilhelm Oetjen, Lübeck, and Frank Benthin, Lübeck, both of Fed. Rep. of Germany, assignors to Dragerwerk AG., Fed. Rep. of Germany

Filed Jun. 20, 1980, Ser. No. 161,352

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1979, 2929706

Int. Cl.³ A61M *16/00*

U.S. Cl. 128—204.13 **3 Claims**



1. A respirator humidifier and heater for air to be inhaled for connection to an inhalation conduit of a respirator, comprising a housing having a bundle of vapor permeable fiber tubes with evaporation fiber wall surfaces extending therethrough, a packing adjacent each end of said tubes sealing a space in said housing around said tubes between said packings, said tubes and the interior of said housing having a thin porous coating on their exterior surfaces of at least one of copper and silver, means for passing inhalation air into the housing in the space around said tubes between said packings, means for circulating warm water through said tubes, wherein said at least one of copper and silver are evaporated onto the surfaces in a vacuum.

4,355,637

SURGICAL MASKS

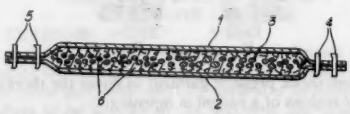
Alan Dyer, Manchester, England, assignor to Laporte Industries Limited, London, England

Filed Mar. 4, 1980, Ser. No. 127,069

Claims priority, application United Kingdom, Mar. 9, 1979, 7908368

Int. Cl.³ A62B *7/10*

U.S. Cl. 128—206.19 **11 Claims**



1. An improved disposable surgical mask of the type comprising at least two layers, wherein the improvement comprises a layer comprising particles of a molecular sieve based on silicon dioxide and having an affinity for nitrous oxide, which layer is disposed between two adjacent layers of the mask, said particles being present in said layer in an amount of not more than 50 grams.

4,355,638

INFUSION APPARATUS

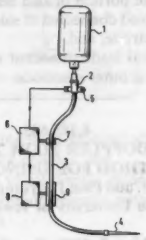
Peter Iwatschenko, Neunkirchen, Fed. Rep. of Germany, and Josef Hirschmann, Fliederstr. 2a, 8021 Neuried, Fed. Rep. of Germany, assignors to Josef Hirschmann, Fed. Rep. of Germany

Filed Dec. 5, 1979, Ser. No. 100,513

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1978, 2853200

Int. Cl.³ A61M *5/00*

U.S. Cl. 128—214 F **20 Claims**



1. Infusion apparatus operable by gravity, and comprising:

a solvent container for being suspended at a higher level than the infusion point; a drop chamber means beneath the container and connected to the container for infusion to drop through;

an infusion needle; an infusion tube connecting the drop chamber means and the needle, the infusion tube being clampable for changing the cross-section thereof;

a tube clamp means connected on the tube for clamping the tube to vary the cross-section thereof to a selected cross-section for controlling the normal gravity flow infusion rate;

pressure increasing means connected externally of the tube at a portion of the tube between the tube clamp means and the needle; the pressure increasing means being selectively actuated in response to predetermined flow conditions in said tube for periodically increasing the pressure in the section of the tube between the tube clamp means and the needle and for thereafter permitting the pressure in that section of the tube to decrease by compressing and then releasing the tube at spaced time intervals.

4,355,639

APPARATUS FOR THE PARENTERAL ADMINISTRATION OF LIQUIDS AT A CONSTANT, ADJUSTABLE FLOW RATE

Francesco Di Salvo, Como, Italy, assignor to Sis-Ter S.p.A., Palazzo Pignano, Italy

Filed Jul. 8, 1980, Ser. No. 166,842

Claims priority, application Italy, May 21, 1980, 22227 A/80

Int. Cl.³ A61M *5/14*

U.S. Cl. 128—214 R **12 Claims**

1. Apparatus for the parenteral administration of a liquid at a constant, adjustable flow rate, comprising

means (**5**, **1**) supplying said liquid under essentially constant, controlled conditions of pressure and having a supply outlet (**17**);

a dripping tube or funnel (**1*a***) secured to said liquid supply means;

support means (**4**) supporting said dripping tube or funnel (**1*a***) at a predetermined level or elevation;

a flow stabilization device (**2**) including

a body (**44**) formed with

a cavity (**51**) therein,

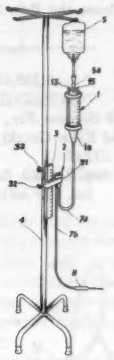
a tubular inlet passage (**42**) communicating with said cavity and a first tubing (**7*a***) connecting said inlet passage with the bottom of said dripping tube or funnel (**1*a***),

a tubular outlet passage (**47**) communicating with said cavity, and a second tubing (**7*b***) adapted for connection of said outlet passage to a cannula (**8**) for administration of the liquid to a patient,

said inlet passage (**42**) having a smaller diameter than the outlet passage (**47**),

and a flexible membrane (**43**) closing off said cavity against ambient air and further removably covering the opening of the outlet passage (**47**) within the cavity;

a stationary scale (**3**) vertically positioned at a controlled level with respect to said predetermined level or elevation;



a slider (**31**) slidable vertically along said stationary scale for vertical adjustment therealong positioned at an elevation below said predetermined level or elevation supported by said slider and vertically adjustably positioned thereby;

and means (**32**) for securing said slider (**31**) and hence said stabilization device (**2**) in vertically adjustable position along said scale to permit reproducibly adjustably positioning of said stabilization device at a level below said predetermined level and to permit controlled flow from said dripping tube or funnel (**1*a***) to and through said stabilization device (**2**) as a function of level difference between the liquid level in said dripping tube or funnel (**1*a***) and said stabilization device.

4,355,640

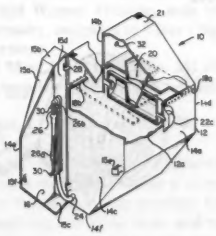
HYGIENIC DISPENSER

Robert C. Johnson, c/o L. Newfield, 2210 Wilshire Blvd. #372, Santa Monica, Calif. 90403

Filed May 13, 1980, Ser. No. 149,495

Int. Cl.³ A61M *3/00*

U.S. Cl. 128—227 **6 Claims**



1. A dispensing hygienic device, comprising:

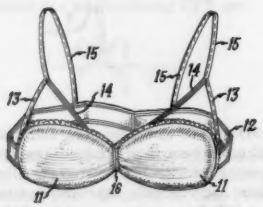
(a) a cabinet having front, rear, lateral, and bottom wall surfaces, respectively, a liquid holding space therewithin, an outlet therefrom and a closable top.

(b) a cylinder, having a centered cavity for holding a non-liquid matter, mounted invertibly between two opposite wall surfaces of the cabinet, causing, when the cylinder is inverted, non-liquid matter therein to drop into and disperse within liquid in the holding space;
(c) a knob disposed rotatably exteriorly to the cabinet and connected to the cylinder through a wall surface of the cabinet, facilitating the inversion of the cylinder;
(d) Dispensing means including a hose, connected to the outlet of the cabinet and terminating in a pipe for dispensing the solution of liquid and non-liquid matters to parts of a living body;
(e) a resilient clip, applicable to a portion of the hose to restrict or release the flow of solution dispersed therethrough.

4,355,641
NURSING BRA

Barbara Dastoli, 45 Brenton Ter., Pittsfield, Mass. 01201; Brigitte Garner, and Ellen Gorski, both of The Hancock Inn, Hancock, Mass. 01237

Filed Sep. 2, 1980, Ser. No. 182,967
Int. Cl.[3] A41C *3/04*
U.S. Cl. 128—460 18 Claims

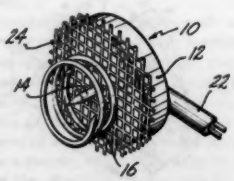


1. A nursing bra comprising:
A pair of support cups;
An upper strap and a lower strap attached to said cups for providing support to said cups;
A support band connecting said cups and adapted to be disposed along the back of the person wearing said bra, said upper strap being composed of a flexible material and said bottom strap being composed of a non-flexible material.

4,355,642
MULTIPOLAR ELECTRODE FOR BODY TISSUE

Clifton A. Alferness, Woodinville, Wash., assignor to Physio-Control Corporation, Redmond, Wash.

Filed Nov. 14, 1980, Ser. No. 206,638
Int. Cl.[3] A61B *5/04*
U.S. Cl. 128—642 18 Claims

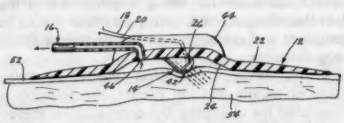


1. A multipolar electrode that is adapted to be implanted in body tissue, said electrode comprising:
a base member having a surface adapted to be brought into proximity to a surface of the body tissue;
an inner electrode supported by said base member and extending in a predetermined direction from said base member surface, at least a portion of said inner electrode being composed of conductive material;
a first outer electrode supported by said base member and extending in said predetermined direction from said base member surface, at least a portion of said first outer electrode being composed of conductive material, said first outer electrode being in the form of a helix which surrounds said inner electrode and said conductive portion of said first outer electrode extending further in said predetermined direction from said base member surface than said conductive portion of said inner electrode;
a first electrical lead connected to said conductive portion of said inner electrode; and,
a second electrical lead connected to said conductive portion of said first outer electrode.

4,355,643
VACUUM CUP DOPPLER FLOW TRANSDUCER AND METHOD FOR USING SAME

Donald E. Laughlin, and Paul J. Krumm, both of West Branch, Iowa, assignors to University of Iowa Research Foundation, Iowa City, Iowa

Filed Mar. 5, 1980, Ser. No. 127,370
Int. Cl.[3] A61B *10/00*
U.S. Cl. 128—663 17 Claims



1. A device for sensing the velocity of fluid flow to human and animal vessels, said device comprising:
a cup means having a concave undersurface and being made of a flexible material which permits said cup means to be yieldably deflected into a substantially flat configuration;
transducer means mounted on said undersurface of said cup means, said transducer means comprising a piezoelectric member having opposite surfaces, a pair of closely spaced sheet members being mounted on one of said opposite surfaces of said piezoelectric member;
electrical lead means connected to said transducer means and leading from said transducer means to above said cup means for connection to a source of electrical signals;
said lead means comprising a pair of electrical leads, each of which is in electrical connection with one of said sheet members;
a vacuum conduit having a first end in communication with the space below said concave surface of said cup means and a second end adapted to be connected to a vacuum source for drawing air from beneath said cup means.

4,355,644
HEART RATE BIO-FEEDBACK SYSTEM

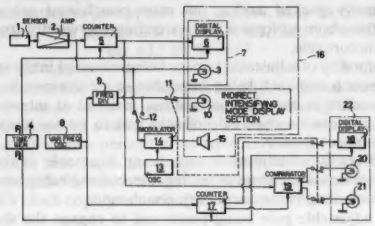
Iwao Saito, 33, Hon-cho, Eniwa, Hokkaido, Japan

Filed Dec. 10, 1979, Ser. No. 101,906
Claims priority, application Japan, Dec. 12, 1978, 53-152718
Int. Cl.[3] A61B *5/04*
U.S. Cl. 128—689 4 Claims

1. A heart rate bio-feedback system comprising:
detector means for detecting the pulse rate of a subject and converting it into a pulse rate signal;
integrating circuit means for integrating said pulse rate signal over a set time interval;
timing generator means for setting said time interval;
display means comprising a display indicator means coupled to said detector means for displaying the momentary pulses of said pulse rate signal, and a digital display means

coupled to said integrating circuit means for displaying the integrated pulse rate signal for said set time interval; variable controlled oscillator means for providing indicating signals independent of the pulse rate at a selective predetermined rate for use as an external stimulus for intensifying the biofeedback process, and

an external stimulus visual display means for displaying said indicating signal simultaneously with the display of said momentary pulses.



4,355,645

DEVICE FOR DISPLAYING MASTICATORY MUSCLE ACTIVITIES

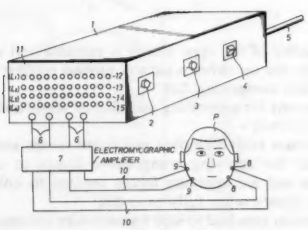
Haruyasu Mitani, Kyoto, and Eiko Mushimoto, Osaka, both of Japan, assignors to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

Filed Oct. 18, 1979, Ser. No. 86,052

Claims priority, application Japan, Oct. 18, 1978, 53-128767

Int. Cl.³ A61B *5/00*

U.S. Cl. 128—777 **8 Claims**



1. A device for displaying masticatory muscle activities for use in correcting unbalanced and abnormal occlusion patterns characterized in that the device comprises a plurality of sets of electrodes (8) and (9) each set consisting of a pair of right and left electrodes, said electrodes being attachable to the surfaces of the masseter and temporal muscles on both sides of a face of a person to be examined so as to detect electromyographic potentials during mastication, a means (I), (II), (III), (IV) and (V) for converting the electromyographic potentials detected by said electrodes (8) and (9) respectively into electrical signals for display, a display means (C), and a means (B) for selectively energizing said display means (C) in response to said signals, said display means (C) comprising display lines (L_1), (L_2), (L_3) and (L_4) of light-emitting members (12) and (13) which are independent over one another for each of said electrodes (8) and (9) whereby the masticatory muscle activity can be displayed during a plurality of consecutive occlusions.

4,355,646

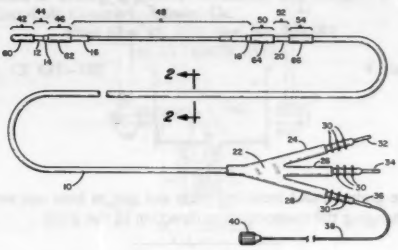
TRANSVENOUS DEFIBRILLATING LEAD

Michael J. Kallok, New Brighton, and John D. Doring, Spring Lake Park, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Nov. 26, 1980, Ser. No. 210,656

Int. Cl.³ A61N *1/04*

U.S. Cl. 128—786 **5 Claims**



1. A transvenous defibrillator lead for insertion into a right ventricle of a heart by way of a superior vena cava comprising:

an insulated conductive lead body having a proximal end and a distal end, said conductive lead body comprising three mutually insulated conductors of drawn brazed strand arranged in a triaxial configuration and an outer sheath of polyurethane;

an electrical connector at said proximal end;

a first electrode having a distal tip with a hemispherical shape attached to said distal end of said insulated conductive lead body;

a second electrode attached to said insulated conductive lead body at a distance from said first electrode wherein said first distance is sufficiently short that said second electrode is within said right ventricle when said first electrode is at an apex of said right ventricle;

a third electrode attached to said insulated conductive lead body at a second distance from said first electrode wherein said second distance is such that said third electrode is within said superior vena cava when said first electrode is at said apex of said right ventricle; and

a fourth electrode attached to said insulated conductive lead body at a third distance from said first electrode wherein said third distance is different from said second distance and wherein said fourth electrode is within said superior vena cava when said first electrode is at said apex of said right ventricle.

4,355,647

DEVICE FOR DISTRIBUTING SCREEN MATERIAL

Franz Heidjann, and Werner Fromme, both of Harsewinkel, Fed. Rep. of Germany, assignors to Claas Ohg, Harsewinkel, Fed. Rep. of Germany

Filed Mar. 3, 1981, Ser. No. 241,457

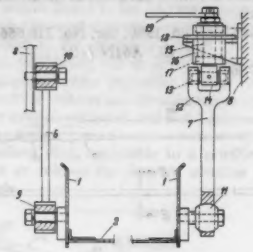
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1980, 3008385

Int. Cl.³ A01F *12/32, 12/44*

U.S. Cl. 130—24 **8 Claims**

1. In a combine harvester having a longitudinal axis, a combination comprising a sieve box having a receiving plate for receiving the grain threshed by the combine harvester and at least one sieve receiving the grain from said receiving plate; drive means operatively connected to said sieve box for oscillating the same in a predetermined direction; and further means operatively connected to the sieve box for changing the direction of oscillation of the latter during movement of the combine harvester over a slope inclined in a direction transverse to said longitudinal axis and concomitant lateral inclination of

said receiving plate and said at least one sieve in dependence on said lateral inclination to thereby obtain a uniform distribution



of the grain on said receiving plate and said at least one sieve by changing the transportation direction of the grain.

4,355,648

METHOD OF CURING TOBACCO

Gordon H. Bokelman, Boulder, Colo., and Dewitt J. Gooden, III, Barnwell, S.C., assignors to Philip Morris, Incorporated, New York, N.Y.

Filed Dec. 9, 1980, Ser. No. 214,491
Int. Cl.³ A24B *3/12, 15/20, 15/22, 15/30*
U.S. Cl. 131—290 **11 Claims**

1. A method of artificially curing green tobacco which comprises:

(a) photobleaching harvested tobacco; and

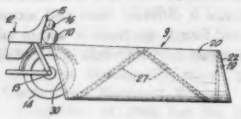
(b) thermally browning the photobleached tobacco.

4,355,649

PORTABLE TENT FOR MOTORCYCLISTS

Allen E. Deragon, Salt Point Rd., Poughkeepsie, N.Y. 12601

Filed Feb. 6, 1981, Ser. No. 232,145
Int. Cl.³ A45F *1/00*
U.S. Cl. 135—1 A **7 Claims**



1. A portable tent for use with motorcycles and the like and being mounted to said motorcycle comprising:

a main pouch having a substantially oval configuration and including a zipper mounted axially along the length thereof and a secondary oval pouch of a smaller size being affixed along the length of the main pouch and having a zipper running axially along the length thereof, said main pouch being mountable on the rear of a motorcycle,

a sheet of tenting material having a plurality of sewn-in pockets along the tent edges thereof and in predetermined intermediate locations on the sides, said sheet being normally packed within the main pouch and extractable therefrom to form a tent extending rearwardly from the motorcycle,

a plurality of adjustable battens being mounted in the smaller pouch and each being insertable in a corresponding side pocket in the sheet of tenting material at intermediate locations on each side of said tent to provie shape and support thereto,

a plurality of adjustable rods being insertable in the end pockets in the sheet of tenting material and being normally contained in the secondary pouch, and,

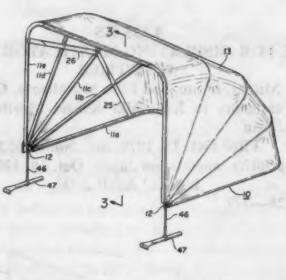
an adjustable pole being positioned to engage the sheet of tenting material at the front end thereof to form a vertical support together with the motorcycle, said pole being normally contained in said pouch.

4,355,650

PORTABLE SHELTER

Jean Beaudry, Apt. 411, 565 St. Charles West, Longueuil, Quebec, Canada (J4H3X8)

Filed Jun. 2, 1980, Ser. No. 155,841
Int. Cl.³ A45F *1/14*
U.S. Cl. 135—7.1 R **12 Claims**



1. A shelter of the type which is portable and collapsible adapted for use on either a natural ground surface or a man-made surface comprising

frame means for supporting said shelter when said shelter is fully erected

cover means extending over said frame means and attached thereto for applying compressive forces to said frame means and for applying forces tending to collapse said frame means when fully extended

brace means attached to said frame means for opposing said collapsing forces,

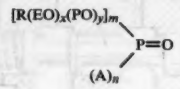
wherein said frame means comprises a first substantially vertical, a last substantially horizontal, and at least one intermediate curved bow members, pivotally attached to their ends to a pair of spaced hub members forming a curved structure having substantially vertical sides, and said brace means includes a pair of oppositely disposed braces attached to said substantially vertical sides, said braces each comprising a first link pivotally attached at one end to said vertical bow and a second link attached at one end to said horizontal bow, the other ends of said links being pivotally attached to each other at their other ends by a connector having a headed stem extending therefrom, said intermediate bow having a keyhole slot formed therein with a larger round portion of said slot being disposed toward said hub member and an elongated portion of said slot extending away from said hub member, said headed stem being received within said keyhole slot and being positioned at the elongated portion of said slot when said structure is fully erected, said links forming an angle therebetween having the apex thereof extending away from said hub member.

4,355,651
METHOD OF TRANSPORTING VISCOUS HYDROCARBONS

Gifford G. McClaflin, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Continuation-in-part of Ser. No. 150,468, May 16, 1980, abandoned. This application Aug. 13, 1981, Ser. No. 292,389
Int. Cl.³ F17D 1/17
U.S. Cl. 137—13 9 Claims

1. In the method of pumping a viscous hydrocarbon through a pipe the improvement which comprises forming an oil-in-water emulsion by adding to said hydrocarbon from about 20 to about 80 volume percent of an aqueous solution containing an effective amount, in the range of about 100 to about 5,000 parts per million, based on said hydrocarbon, of a phosphate ester of a block copolymer which is represented by the formula

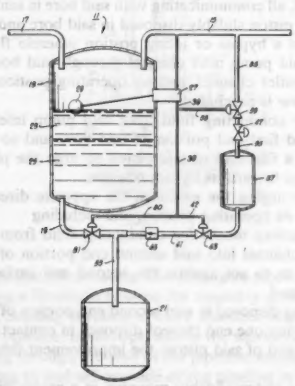


wherein
R is a C_2 to C_{30} alkyl group,
EO is an ethylene oxide unit,
PO is a propylene oxide unit,
x is a number in the range of about 2 to about 7,
y is a number in the range of about 2 to about 5,
A=OH,
m is an integer of 1 to 3
n is an integer of 0 to 2 with the sum of m+n being 3

4,355,652
PURGING DEVICE

Lawrence B. Perkins, 1616 Ninth St., Woodward, Okla. 73801

Filed Jul. 21, 1980, Ser. No. 170,512
Int. Cl.³ B08B 9/02
U.S. Cl. 137—15 12 Claims



12. A method to prevent freezing of a dump line on a gas well separator of the type having a float valve responsive to the liquid level in a separator tank which actuates a dump line valve to regulate the flow of liquid from the separator tank to the holding tank, comprising the steps of:

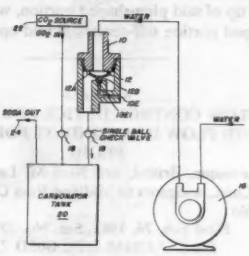
filling a gas reservoir connected between a source of pressurized gas and said dump line with pressurized gas while the dump line valve is open and liquid is being transferred from said separator tank to the holding tank in response to a first position of said float valve; and

after the dump line valve is closed, discharging said pressurized gas in the gas reservoir into said dump line between the dump line valve and the holding tank to clear the dump line of liquid in response to a second position of said float valve such that liquid is not stagnant in the dump line and prone to freeze.

4,355,653
VENTED CHECK VALVE

William S. Credle, Jr., Stone Mountain, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.

Filed May 12, 1981, Ser. No. 263,093
Int. Cl.³ G05D 7/00
U.S. Cl. 137—102 4 Claims



1. In a post-mix beverage carbonator system including a water supply, a source of carbon dioxide gas, a carbonator tank for mixing the water from the water supply with the carbon dioxide gas and producing a carbonated water mixture, supply pipes for connecting said carbonator tank to said water supply, pumping means for pumping the water from the water supply to the carbonator tank, and check valve means disposed between said carbonator tank and said pumping means, the improvement comprising:

vented check valve means disposed between said check valve means and said pumping means for passing said water therethrough in one direction during normal operation and preventing the carbonated water mixture in the carbonator tank from backflowing into said supply pipes in an opposite direction in the event of a malfunction in the operation of said check valve means, said vented check valve means including a body portion having a chamber therein containing a movable valve element, an inlet passage and two outlet passages communicating with said chamber, a first of said outlet passages having a first opening on an opposite side of said chamber from said inlet passage and aligned therewith and a second opening communicating with the atmosphere, the walls of said chamber surrounding said inlet passage defining a first valve seat, said first opening of said first outlet passage defining a second valve seat, a second outlet passage communicating with said chamber in a position offset from said inlet and said first outlet passages, said movable valve element connecting only said inlet passage and said second outlet passage though said chamber during said normal operation and connecting only said first and second outlet passages through said chamber during said backflow condition, an improvement in said movable valve element comprising:

a flexible diaphragm having an annular sealing portion for operative engagement with said first valve seat and a plug-shaped sealing portion extending therefrom and integral therewith for operative engagement with said second valve seat;

said flexible diaphragm in the absence of fluid flow through said valve body being self-biased in a first shape so that said annular sealing portion firmly seats on said first valve seat and said plug-shaped portion firmly seats in said opening defining said second valve seat;

said flexible diaphragm during said normal operation

having a second shape wherein said annular sealing portion is unseated from said first valve seat and said plug-shaped portion is firmly seated in said second valve seat;

said flexible diaphragm during said backflow condition having a third shape wherein said annular sealing portion firmly seats on said first valve seat and said plug-shaped portion is unseated from said second valve seat; and

wherein said opening defining said second seat has sloped side walls converging from the walls of said chamber toward said first outlet passage, said opening at the walls of said chamber being larger than the diameter of the tip of said plug-shaped portion, whereby said plug-shaped portion self-centers in said opening.

4,355,654

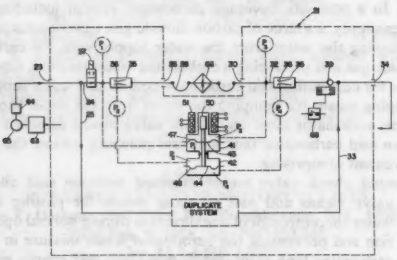
FLUID FLOW CONTROL DEVICE FOR MONITORING THE FLUID FLOW IN A CONDUIT FOR LEAKAGE OF FLUID

Paul N. Levesque, Bristol, and Neal M. Lavado, Watertown, both of Conn., assignors to Midland-Ross Corporation, Cleveland, Ohio

Filed Feb. 26, 1981, Ser. No. 238,497

Int. Cl.³ G01M *3/28;* G05D *7/06*

U.S. Cl. 137—110 **13 Claims**



1. A device for monitoring the flow of fluid in at least one pair of conduits attached thereto, and blocking the flow of fluid in at least one of the conduits when leakage of fluid occurs therein, comprising:

(a) a housing;

(b) a fluid inlet through which fluid from a source outside the housing, enters the housing;

(c) a plurality of inlet passageways within the housing for receiving and dividing the flow of fluid entering the fluid inlet into branches, the inlet passageways terminating at a plurality of discharge ports to which fluid conduits are attachable for carrying fluid from the device;

(d) a plurality of reentry ports to which fluid conduits are attachable and through which fluid carried by the fluid conduits is returned to the housing of the device;

(e) an outlet passageway within the housing for each reentry port and communicating therewith for receiving fluid returning to the device, the outlet passageways terminating at a fluid outlet through which fluid exits the device, for example, to return to the source;

(f) means associated with each of the inlet and outlet passageways for monitoring the flow of fluid therein and translating such flow into electrical signals; and

(g) means responsive to the electrical signals for operating a shutoff valve to block the flow of fluid through an inlet passageway when there is a variance in the electrical signals from a norm, indicating leakage of fluid in a fluid conduit communicating with the blocked inlet passageway.

4,355,655

HYDRAULIC CONTROL APPARATUS FOR LOAD INDEPENDENT FLOW REGULATION

Siegfried Hertell, Radevormwald; Claus Kirchherr, Remscheid; Horst Kahl, Wermelskirchen, and Siegfried Hoffmann, Leichlingen, all of Fed. Rep. of Germany, assignors to Barmag Barmer Maschinenfabrik, Remscheid, Fed. Rep. of Germany

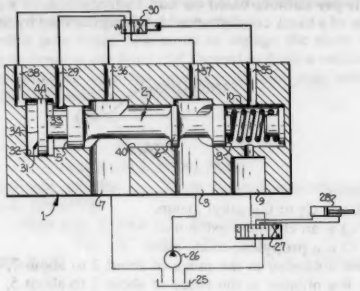
Division of Ser. No. 125,096, Feb. 27, 1980, Pat. No. 4,303,091.

This application Sep. 23, 1981, Ser. No. 304,716

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1979, 2908018

Int. Cl.³ F15B *13/04*

U.S. Cl. 137—117 **2 Claims**



1. A flow control apparatus adapted to provide load independent flow regulation in a hydraulic power system or the like, and characterized by the ability to minimize the idling power consumption of the pump when the load is removed from the system, and comprising,

a housing having a cylindrical bore therein, said bore having closed opposite ends so as to define first and second opposite end portions;

a pump inlet channel, a sump outlet channel, and a consumer channel, all communicating with said bore in said housing,

a balance piston slidably disposed in said bore and movable between a bypass or idling postion wherein fluid flows from said pump inlet channel through said bore to said sump outlet channel, and an operating postion wherein such flow is precluded,

means for conducting fluid from said pump inlet channel into said first end portion of said bore and so as to act against a first end of said piston to urge the piston in a direction toward its bypass position,

means for urging the piston in the opposite direction and toward its operating postion, and including

(a) passageway means for conducting fluid from the consumer channel into said second end portion of the bore and so as to act against the second end surface of the piston, and

(b) a spring disposed in said second end portion of said bore and having one end thereof disposed in contact with said second end of said piston, the improvement therein comprising

a retaining piston slidably mounted in a cavity disposed in said housing in communication with said first end portion of said bore, said cavity having a transverse dimension substantially greater than that of said bore and said retaining piston having an enlarged head closely received within said cavity and a body portion extending axially toward said first end of said balance piston, with said head defining a forward bore portion between said head and said first end of said balance piston, and a rearward bore portion on the opposite side of said head,

control means for alternatively

(a) conducting fluid from said pump inlet channel to said forward bore portion while opening said rearward bore

portion to said sump outlet channel, to thereby withdraw said retaining piston from contact with said balance piston, or

(b) conducting fluid from said pump inlet channel to said rearward bore portion while opening said forward bore portion to said sump outlet channel, to thereby bias said retaining piston into contact with said balance piston,

whereby the retaining piston is adapted to amplify the force tending to move the balance piston toward the bypass position and against the spring during non-operation of a consumer load, and the amplifying force is removed during operation of the consumer load, to thereby minimize the pressure of the fluid in the pump inlet channel which is required to move the balance piston to the bypass position.

4,355,656

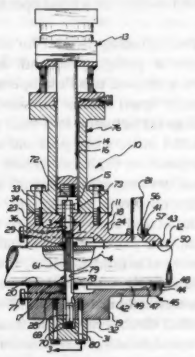
PIPELINE PLUG AND BYPASS

William B. Smith, Berea, Ohio, assignor to The Pipe Line Development Company, Cleveland, Ohio

Filed Apr. 28, 1981, Ser. No. 258,476

Int. Cl.³ F16K *43/00*; F16L *55/10, 55/18*

U.S. Cl. 137—318 **9 Claims**



1. Apparatus for diverting flow through a pipeline in service, comprising a fluidtight housing for assembly around the pipeline, said housing forming a work chamber around an axial length of pipeline, means operable in the work chamber to cut an opening through the wall of the pipeline, means operable in the housing to seal off one side of the pipeline in a zone adjacent the cut formed by said cutting means from the other side of the pipeline, and passage means for directing bypass flow between said one pipeline side, said opening, and the exterior of said housing, said passage means directing bypass flow through said opening radially around the cut edge of the pipe wall between the cutting means and the cut wall edge, said passage means in the area defined by an axial limit of the cutting means being within the radial extent of the cutting means and, out of said area of the cutting means, extending through a space radially interiorly bounded by said one side of the pipeline and radially exteriorly by said housing thereby completely isolating said bypass flow from said work chamber.

4,355,657

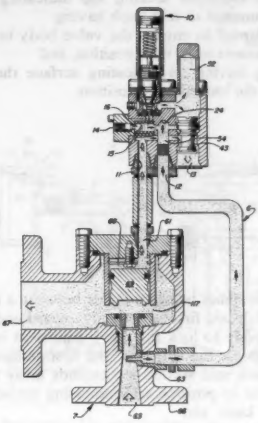
PILOT OPERATED RELIEF VALVE

Raymond G. Reip, Indian Head Park, Ill., assignor to Vapor Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 943,377, Sep. 18, 1978, abandoned. This application Sep. 30, 1980, Ser. No. 192,312

Int. Cl.³ F16K *31/122*

U.S. Cl. 137—492 **7 Claims**



1. A pressure sensitive pilot valve for operating a main product pressure relief valve comprising;

a valve body;

a valve seat in said body;

a product inlet in said body, in pressure communication with said seat;

a poppet contained in said body and mounted for reciprocal movement therein, said poppet seated on and restricting flow through said seat for product pressures below a predetermined value, and allowing flow through said seat for pressures exceeding said predetermined value;

a test port in said body;

means, in said body, fluid communicating said test port, and seat;

means in said body fluid communicating said product inlet and communicating means;

fluid permeable guide means intermediate said test port and communicating means thereby fluid communicating said inlet test port and seat;

a flow sensitive closure member contained in said guide means for reciprocal motion therein, said member sealing said test port or inlet at either end of said reciprocal motion;

wherein introduction of a test vapor at a pressure greater than normal product pressure isolates said product inlet, and operating said poppet providing pilot operation exclusive of increasing said product pressure.

4,355,658

PILOT VALVE WITH INDICATING LOCKOUT KNOB

David E. Snyder, Longview, Tex., assignor to U.S. Industries, Inc., New York, N.Y.

Filed Dec. 15, 1980, Ser. No. 216,811

Int. Cl.³ F16K *37/00*

U.S. Cl. 137—557 **9 Claims**

1. In a pilot valve for controlling a supply of control fluid to a controlled valve, having a body, an inlet port, an outlet port, an exhaust port, a pilot port, a valving element responsive to a pilot pressure shiftable between an inlet position allowing communication between the inlet and outlet port and an exhaust position allowing communication between the outlet and

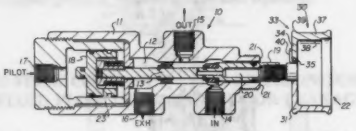
exhaust ports, said valving element having a shaft portion extending exteriorly of the valve body, and a resilient means for biasing the valving element toward its exhaust position, the improvement conprising a pilot bypass locking and indicating means comprising:

(1) a valve knob connected to the valving element for manually shifting the element from its exhaust to its inlet position;

(2) a generally L-shaped locking and indicating member pivotally connected to said knob having

a first leg adapted to engage the valve body to lock the valving element in its inlet position, and

a second leg having an indicating surface thereon for indicating the locked inlet position,



said locking member being rotatable between a first position in which said first leg extends toward and engages the valve body to lock the valving element in its inlet position against the action of the first resilient means and in which said second leg extends away from the shaft portion to position said indicating surface visibly above said knob, and

a second position in which said locking member has said first leg disengaged from the valve body and said second leg extending along and adjacent to said knob to conceal said indicating surface from view, and

(3) a second resilient means carried by said knob and one of said leg portions and engaging said locking member for biasing it toward its second position.

4,355,659

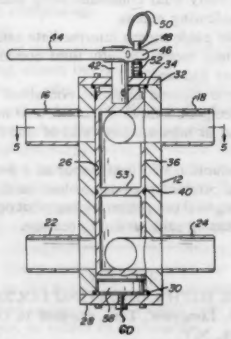
ROTARY PLUG VALVE

Jay R. Kelchner, Montour Falls, N.Y., assignor to The Hilliard Corp., Elmira, N.Y.

Filed Jan. 8, 1981, Ser. No. 223,513

Int. Cl.³ F16K *11/07*

U.S. Cl. 137—625.19 **3 Claims**



1. A multiple inlet multiple outlet rotary plug valve comprising a valve body having an upper set of three ports and a lower set of three ports, each set occupying about 180° of valve body circumference, one set of ports including a single inlet and multiple outlets, the other set of ports including multiple inlets and one outlet, each port of the upper set being above a port of the lower set, a cylindrical bore of uniform diameter in said housing and communicating with each port of each set, a cylindrical plug of uniform diameter rotatably mounted in said bore, said plug having a peripheral groove intermediate its ends, means including a deformable seal in said groove for preventing cross-flow between the ports of said sets, said plug having a discrete peripheral flow passage associated with each set of ports, each plug flow passage occupying about 180° of the plug circumference, whereby each valve body port communicates with the associated valve body ports of its set in one position of the plug, and a handle connected to one end of said plug for rotating said plug about its longitudinal axis between open and closed positions.

4,355,660

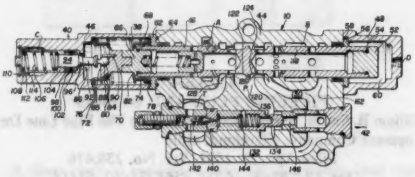
PNEUMATICALLY CONTROLLED, FOUR POSITION HYDRAULIC VALVE

Theron M. Huffman, Paw Paw, Mich., assignor to General Signal Corporation, Stamford, Conn.

Filed Apr. 15, 1980, Ser. No. 140,519

Int. Cl.³ F16K *11/07*

U.S. Cl. 137—625.63 **10 Claims**



1. A fluid control system for a fluid operated motor comprising:

a hydraulic valve including an inlet for receiving fluid under pressure from a pump, first and second work ports adapted to be contacted to a fluid operated motor, a return outlet, a power spool means for selectively establishing communication (a) between said inlet and one work port and between the other work port and said return outlet at a first power position; (b) between said inlet and said other work port and between said one work port and said return outlet at a second power position; (c) between said inlet, said return outlet and both work ports simultaneously at a float position, and (d) no communication to or between said work ports at a hold position, first and second pilot ports communicating with said power spool means for receiving pressurized pilot fluid to move said power spool in opposite axial directions, detent means for maintaining said power spool in said float position after said second power position upon cessation of said pressurized pilot fluid at said first pilot port until overcome by pressurized pilot fluid at said second pilot port, and return means for positioning said power spool (a) to said hold position after said first power position, (b) to said float position after said second power position, and (c) to said hold position after said detent is overcome; and

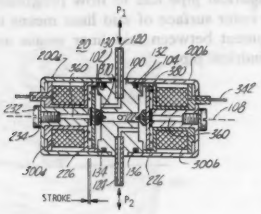
a low pressure pilot valve including an inlet for receiving fluid under pressure from a pump, first and second work ports connected to said first and second pilot ports of said hydraulic valve respectively, an outlet, spool means for selectively establishing communication (a) between said inlet and one work port and between said outlet and the other work port at a first drive position, (b) between said inlet and said other work port and between said outlet and said one work port at a second drive position, (c) between said outlet and both said first and second work ports at a neutral position, and return means for positioning said spool in said neutral position after said first and second drive positions.

4,355,661

DUAL SOLENOID VACUUM MODULATOR

Endre A. Mayer, Birmingham, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Division of Ser. No. 946,883, Sep. 28, 1978, Pat. No. 4,258,749.
This application Apr. 21, 1980, Ser. No. 142,525
Int. Cl.³ F15B 13/044
U.S. Cl. 137—881 1 Claim



1. A control valve comprising:

a valve body having a central axis, and a first end and a second end both perpendicular to said central axis of said valve body, each end containing a countersunk boss concentric to said central axis, said valve body further having a central bore coaxial to said central axis and joining each of said bosses, said central bore and each boss therein forming a pair of valve seats, said valve body further containing a first port, extending through said valve body connecting with one of said bosses, a second port extending through said valve body, connecting with the other of said bosses and a third port extending through said valve body connecting with said central bore;

a split housing means having two housing sections for enclosing said first end and second end;

each housing section being a generally cylindrical cupshape structure containing sidewalls, a bottom, and a valve guide means having a central channel, which when assembled is coaxial with the central axis of said valve body;

a pair of valve means for controllably establishing pressure communications among said first, second and third ports, each of said valve means slideably disposed within the central channel of a corresponding one of said valve guide means and biased against one of said valve seats to close each end of said central bore and including:

a pair of electrically actuatable solenoid coil assemblies concentrically disposed in said housing about said valve guide means for generating a magnetic holding force for unseating said valve means from said valve seat; and

a nonmagnetic spacer disposed on said valve means between said valve means and said valve guide means for limiting the magnetic holding force exerted on said valve means;

wherein each of said valve means includes:

a rod-like member, adapted to be received within said central bore;

a resilient valve attached to one end of said rod-like member; and

a ferro-magnetic plate situated between said rod-like member and said valve, said plate having a larger diameter than said valve; and

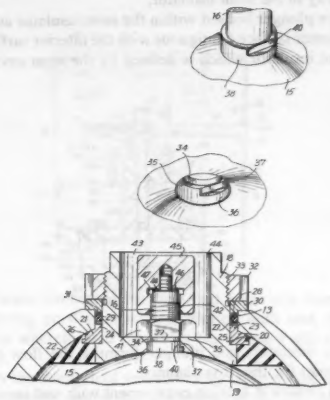
wherein said nonmagnetic spacer comprises a washer-like member mounted to said plate on an opposing surface opposite from said valve.

4,355,662

REPAIRABLE ACCUMULATOR DEVICE

James K. Floyd, Yorba Linda, Calif., assignor to VSI Corporation, Pasadena, Calif.

Filed Apr. 29, 1981, Ser. No. 258,458
Int. Cl.³ F16L 55/04
U.S. Cl. 138—30 4 Claims



1. A top repairable accumulator device comprising, in combination, a pressure vessel having an oil port at a bottom end and a gas charging port at a top end, a gas charging valve assembly mounted in said top end, said valve assembly including a fitting member removably mounted in said gas charging port, a generally cylindrical chamber on said fitting externally of said port, a transverse wall portion on said fitting having a bore therein, said bore being aligned generally coaxially of said chamber, a bladder assembly disposed within said vessel, said assembly including a bladder having an opening, a generally cylindrical hollow valve mounting stem disposed in said opening and bonded to said bladder, said stem having an external thread portion, said stem extending through said bore of said fitting and into said cylindrical chamber, eccentric interfit means extending between said stem and said fitting for keying said stem against rotation relative to said fitting, and a jam nut disposed within said chamber and threadedly connected to said thread portion of said stem and clamping said stem to said fitting.

4,355,663

NOZZLE/VALVE DEVICE FOR A DUCTED ROCKET MOTOR

William M. Burkes, Jr., and William H. Miller, both of McGregor, Tex., assignors to Hercules Incorporated, Wilmington, Del.

Filed Mar. 11, 1980, Ser. No. 129,284
Int. Cl.³ F15D 1/02; B64C 15/08; F02K 9/04
U.S. Cl. 138—44 10 Claims

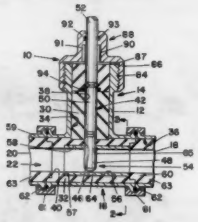
1. A nozzle/valve for controlling the flow of combustion products from a fuel generator to a secondary combustion chamber of a ducted rocket motor, said nozzle/valve comprising

a valve body having a stem section and a flow section intersecting and attached to said stem section, said stem section comprising an outer stem member and a stem insulator for said outer stem member housed within said outer stem member and extending throughout the length of the outer stem member, said stem insulator having a central longitudinal stem cavity extending throughout the length of the insulator,

a flow section comprising an outer flow member and a flow insulator for said outer flow member housed within and

extending throughout the length of the outer flow member, said flow insulator having side walls and a central longitudinal cavity extending throughout the length of the flow insulator, the cavity in said flow insulator defining a flow channel through said flow section, and a second cavity extending through the side wall of said flow insulator which second cavity is in registration with the stem cavity in the stem insulator,

a valve plunger housed within the stem insulator and having its outer surface contiguous with the interior surface of the stem insulator which is defined by the stem cavity in the



stem insulator, said plunger forming the flow blockage element for the flow channel,

a stem closure in locking engagement with said stem section,

first seal means for sealing between the stem closure and the stem section,

second seal means for sealing between the stem closure and the valve plunger, and,

actuator means for imparting translational movement to the valve plunger to move said plunger between a closed position in which said plunger partially blocks the flow channel and an open position in which said plunger is removed from the flow channel.

4,355,664

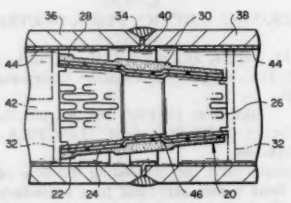
APPARATUS FOR INTERNAL PIPE PROTECTION

Paul M. Cook, Menlo Park; Richard F. Otte, Los Altos Hills; James L. Claypool, Mountain Vew; Lawrence J. White, San Jose; Harry C. Broyles, Sunnyvale, and Peter L. Brooks, Los Altos, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Jul. 31, 1980, Ser. No. 174,304

Int. Cl.³ F16L 9/14

U.S. Cl. 138—110 **10 Claims**



1. A device for protecting the inside of a pipe, the pipe comprising a cylindrical member, said device comprising:

tubular delivery means, said delivery means being generally frustro-conical in shape and having a radially continuous sidewall which is cage-like with a plurality of slots therein, said delivery means being flexible in both radial and axial directions, said delivery means being capable of radial expansion upon application of heat;

tubular liner means outside of and in contact with said delivery means, said liner means being generally frustro-conical in shape, corrosion resistant and deformable substantially only radially upon application of heat; and

bonding means outside of and in contact with said liner means to bond said liner means to the inside surface of a cylindrical pipe, said bonding means being flowable and activated by application of heat, said delivery means expanding radially upon application of heat uniformly along the length of the device, the radial expansion of the frustro-conical shaped delivery and liner means causing said bonding means to progressively contact the inside of a cylindrical pipe and to flow progressively axially along the outer surface of said liner means to preclude air entrapment between said liner means and the inside of a cylindrical pipe.

4,355,665

HEDDLE

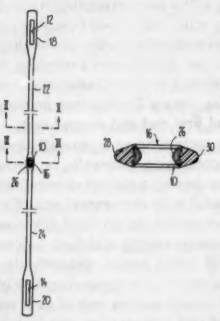
Paul Ramseier, Pfäffikon, and Hans Burkhalter, Schönenberg, both of Switzerland, assignors to Bräcker AG, Pfäffikon, Switzerland

PCT No. PCT/CH79/00115, § 371 Date May 26, 1980, § 102(e) Date May 8, 1980, PCT Pub. No. WO80/00719, PCT Pub. Date Apr. 17, 1980

PCT Filed Aug. 31, 1979, Ser. No. 190,313

Int. Cl.³ D03C 9/00

U.S. Cl. 139—96 **8 Claims**



1. A heddle comprising:

a plastics material portion formed of a plastics material;

a warp thread guiding eye inserted into said plastics material portion;

said thread guiding eye possesses a substantially crescent-shaped cross-sectional configuration;

said thread guiding eye being formed of a material which is harder than the plastics material of said plastics material portion;

said thread guiding eye being embedded in the plastics material of the plastics material portion;

said thread guiding eye being partially surrounded by the plastics material of said plastics material portion;

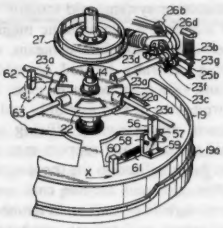
said thread guiding eye having outer edges which are molded around and interengaged by said plastics material of said plastics material portion; and

said thread guiding eye having an inner surface which forms a smooth transition to the plastics material portion.

4,355,666
SHUTTLE PROPELLING MECHANISM IN CIRCULAR LOOM

Soichi Torii, Kyoto, Japan, assignor to Torii Winding Machine Co., Ltd., Kyoto, Japan

PCT No. PCT/JP79/00138, § 371 Date Jul. 23, 1980, § 102(e) Date Jul. 23, 1980, PCT Pub. No. WO80/01173, PCT Pub. Date Jun. 12, 1980
PCT Filed May 29, 1979, Ser. No. 196,915
Claims priority, application Japan, Nov. 29, 1978, 53-148529
Int. Cl.[3] D03D *37/00*
U.S. Cl. 139—13 R 5 Claims



1. In a circular loom comprising an annular guide means for guiding at least one shuttle in a predetermined direction, a warp guide annular member disposed above said annular guide means coaxially therewith and having a plurality of warp guide slits, a plurality of shed forming mechanisms arranged annularly outside said warp guide annular member, a cylindrical cam mechanism mounted coaxially with said shuttle guide means, means for operating said shed forming mechanisms prior to arrival of the shuttle to form moving sheds, in a condition of successively forming sheds along said annular guide means, a mechanism for taking out a woven fabric along the axis of said shuttle guide means and driving means for rotating the cylindrical cam mechanism around the axis thereof in the direction of guiding the shuttle by the shuttle guide means, a shuttle propelling mechanism comprising a horizontal supporting member mounted rotatably at a position above said cylindrical cam mechanism on an upward extension of the rotation shaft of the cylindrical cam mechanism, at least one horizontal shaft corresponding to the shuttle to be used, said horizontal shaft being fixed to said supporting member and being extended to a position adjacent to said shuttle guide means, a shuttle engaging mechanism mounted on a free end portion of said horizontal shaft and means for transmitting the rotation of the cylindrical cam mechanism to any of said horizontal shafts.

4,355,667
HEDDLE FRAME

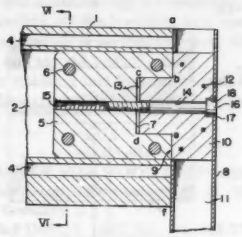
Yoichi Shimizu, Izumishi, Japan, assignor to Kabushiki Kaisha Maruyama Seisakusho, Sakaishi, Japan

Filed Jun. 11, 1980, Ser. No. 158,352
Claims priority, application Japan, Sep. 3, 1979, 54-120467
Int. Cl.[3] D03C *9/06*
U.S. Cl. 139—91 4 Claims

1. In a heddle frame having at least one hollow horizontal aluminum bar and at least one hollow side stay, a joint connecting one end of one said at least one aluminum bar and one said at least one side stay, said joint comprising:

a receptacle fixedly fitted into the hollow of said one aluminum bar at said one end of said one aluminum bar with one face of said receptacle flush with said one end, said one face defining a channel section, and a fixing bore extending into said receptacle from said channel section in the longitudinal direction of said aluminum bar;

a connecting piece fixedly fitted into the hollow of said side stay and having one face flush with a surface of said side stay, said one face of said connecting piece including a projecting portion adapted to mate with said channel section whereby said one face of said receptacle and said one face of said connecting piece mate with one another, said connecting piece also including a second bore extending therethrough from said projecting portion, said second bore being in alignment with said fixing bore when said channel section and said projecting portion are mated to one another; and



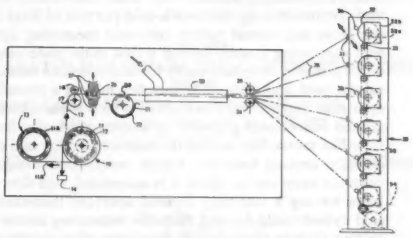
fixing means connected between said bores and fixing said projecting portion in mating relation with said channel section whereby said aluminum bar and said side stay are joined,

whereby the strength of said joint may be increased without increasing the size of said aluminum bar and said side stay.

4,355,668
GRAPHITE FIBER ALIGNMENT PROCESS AND APPARATUS AND FABRIC PRODUCED THEREFROM

Frederick H. Curzio, Garden Grove, Calif., assignor to Textile Products, Incorporated, Anaheim, Calif.

Division of Ser. No. 933,658, Aug. 14, 1978, Pat. No. 4,271,570.
This application Jan. 25, 1980, Ser. No. 115,391
Int. Cl.[3] D03D *15/00*
U.S. Cl. 139—420 R 8 Claims



1. A fabric of aligned graphite fibers having a uniform density and weave and uniform physical properties in both the warp and fill direction, the fabric being adapted to follow the contours of a support substrate, the fabric being formed from strands derived by unwinding from a graphitized strip produced in a graphitizing furnace, the unwinding process subsequent to the graphitizing furnace comprising the steps of:

i. initially separating individual graphite strands from the strip;

ii. diverging the strands while separating the strands from the graphitized strip under tension;

iii. feeding each strand through a separate alignment tube; and,

iv. winding up a plurality of strands, each strand being on a separate aligned reel, a plurality of aligned reels having at least one drive rod therefor, each reel being maintained forwardly in off-centered contact with the drive rod due

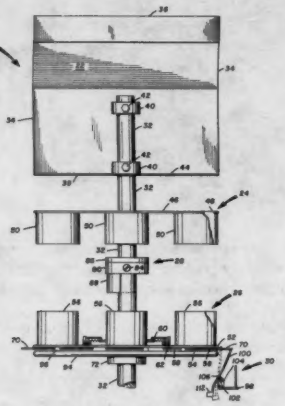
to strand tension, whereby release of strand tension causes the reel to move out of alignment.

4,355,669

APPARATUS FOR CANNING FOOD

James H. Miller, P.O. Box 623, Eastpoint, Fla. 32328

Filed Aug. 25, 1980, Ser. No. 180,922
Int. Cl.³ B65B *43/42*
U.S. Cl. 141—147 **6 Claims**



1. An apparatus for canning food, comprising:

a hopper means, said hopper means having walls thereabout, said hopper means holding a supply of food to be measured into predetermined amounts for filling into containers;

a funnel system, said funnel system interfacing and communicating with said hopper means, said funnel system receiving a portion of said food from said hopper means;

a measuring system, said measuring system slidingly and removably mating telescopably with said funnel system and communicating therewith, said portion of food flowing from said funnel system into said measuring system, said measuring system having a first main plate member and a plurality of cylindrically formed tube-like measuring means, said first main plate member having a plurality of apertures therethrough to each of which is assembled and affixed one of said plurality of said cylindrically formed tube-like measuring means, the interior of each said cylindrically formed tube-like funnel means communicating with the aperture to which it is assembled, said first main plate having a centrally located aperture therethrough, said cylindrically formed tube-like measuring means projecting slightly through said first main plate member;

a dispensing system, said dispensing system being affixed to said measuring system and operating therewith, said dispensing system having a plurality of dispensing gates, each dispensing gate of said plurality of dispensing gates having an outstanding lug and a projecting trip arm extending therefrom, each of said dispensing gates being slidably and movably affixed to the underside of said first main plate member by said outstanding lug on said dispensing gate, each said dispensing gate being slidably movable across the end of said slightly projecting cylindrically formed tube-like measuring means projecting through said first main plate member, each said dispensing gate further having said projecting trip arm extending past the outside periphery of said first main plate member to operate said dispensing gate and slidably move it off said end of said projecting cylindrically formed tube-like measuring means to dispense food therefrom;

an assembly and support means, said assembly and support means being centrally located for removable assembly and support of said hopper means and for removable assembly of said funnel and measuring means, said first main plate being slidably and removably assembled to said assembly and support means through said aperture in said first main plate;

a locator means, said locator means being slidably and removably assembled and affixed to said assembly and support means between said funnel system and said measuring system, said locator means fixing spaced relationship between said funnel system and said measuring system, said spaced relationship determining amount of said portion of said food received from said hopper means and flowing into said measuring system, said locator means having a main collar member, a non-metallic member, an arc-like cam member, and an attachment means, said main collar member being centrally located on said assembly and support means, said main collar member having an aperture therethrough to fit said assembly and support means, said attachment means rigidly affixing said main collar means to said assembly and support means, said non-metallic member being affixed to the topmost side of said main collar member, and said arc-like cam member being affixed to the underside of said main member

a trigger mechanism, said trigger mechanism being separately located and positioned to operate said dispensing system, and

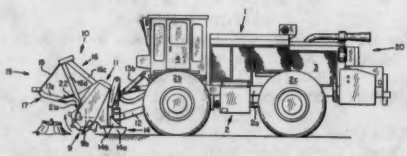
a control means, said control means being for said dispensing gate, said control means consisting of a pin member, a lever-like arm, and a tension spring, said pin member being rigidly affixed to said outstanding lug, said pin member movably projecting through said second main plate member and being rigidly affixed to said lever-like arm, said lever-like arm being connected to said tension spring member, said tension spring member being suitably anchored to said second main plate member to automatically close said dispensing gate when dispensing of food is completed, said arc-like member of said locator means controlling the operation of said lever-like arm if and when said tension spring member fails.

4,355,670

FORESTRY SITE PREPARATION SYSTEM

George E. Ohrberg, Bogalusa, and James R. O'Dair, Alexandria, both of Calif., assignors to Crown Zellerbach Corporation, San Francisco, Calif.

Continuation-in-part of Ser. No. 853,054, Nov. 21, 1977, abandoned. This application Nov. 13, 1978, Ser. No. 959,967
Int. Cl.³ A01G *23/08*
U.S. Cl. 144—34 R **22 Claims**



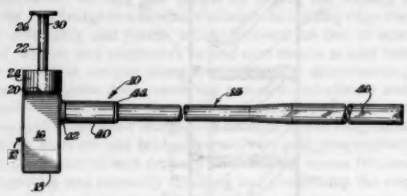
1. A forestry site preparation system adapted for use with an apparatus capable of transporting said system through woody terrain, comprising means for clearing woody material, including trees, tree stumps, and slash, for said woody terrain, said clearing means including means for fragmenting said woody material into particulate masses and said system also comprising at least one auxiliary fragmenting means for further fragmenting said particulate masses, thereby substantially controlling the size of said particulate masses, said clearing means further including means for conveying said particulate masses toward said auxiliary fragmenting means.

4,355,671

WOOD SPLITTING TOOL

Albert B. Senior, III, Box 290, Middletown, Del. 19709

Filed Jan. 28, 1981, Ser. No. 229,106
Int. Cl.³ B27L 7/00
U.S. Cl. 144—193 C 9 Claims



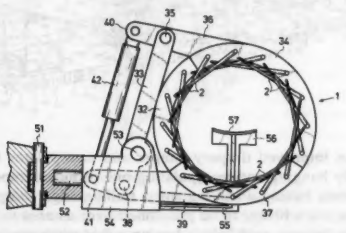
1. A wood splitting tool comprising a head with handle means secured thereto and extending therefrom, the head including a wedge having a wood engaging edge portion and an opposite top surface portion, a pin secured to the wedge and extending outwardly from the top surface portion thereof, an impact weight slidably mounted on the pin, and means at the free end of the pin for preventing removal of the impact weight whereby upon swinging the tool the weight slides along the pin and strikes the top surface portion of the wedge to provide a second hit immediately after the edge portion of the wedge engages the wood, and wherein the wood engaging edge portion of the wedge and the impact weight are on opposite sides of the axis of the handle means.

4,355,672

APPARATUS FOR REMOVING BRANCHES AND BARK FROM FELLED TREES

Johann C. F. Hiller von Gaertringen, Schloss, 8601 Weiher, Fed. Rep. of Germany

Filed Feb. 27, 1979, Ser. No. 15,805
Claims priority, application Fed. Rep. of Germany, Feb. 28, 1978, 2808613
Int. Cl.³ B27L 1/00
U.S. Cl. 144—208 E 22 Claims



1. An apparatus for removing branches and bark from felled trees which are moved through said apparatus, said apparatus comprising:

(a) a ring member for moving therethrough a felled tree, said ring member having first and second axially spaced surfaces;

(b) a plurality of first knives mounted on said ring member at said first surface thereof for pivotal movement between an operative position in working engagement with the respective tree being moved through said ring member and a rest position disengaged from the tree, each of said first knives having a longitudinal central plane extending substantially perpendicular to the surface of the tree and cutting edge for cutting off branches from the tree, said cutting edge extending substantially parallel to said first surface;

(c) a plurality of second knives mounted on said ring member at said second surface thereof for pivotal movement between an operative position in working engagement with the tree and a rest position disengaged from the tree, each of said second knives having a longitudinal central plane extending at a small angle with respect to the surface of the tree and a cutting edge for removing bark from the tree after cutting off the branches, said second knife cutting edge extending at an angle of from 20° to 60° with respect to said second surface; and

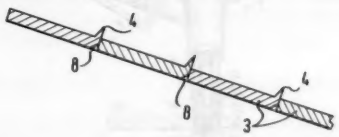
(d) means for retaining said first and second knives in resilient engagement with the tree in their operative position.

4,355,673

CUTTER FOR WOOD CHIPPERS

Karl-Heinz Köstermeier, Eckelsheimerstr. 18, 6556 Wöllstein, Fed. Rep. of Germany

Filed Dec. 11, 1980, Ser. No. 215,273
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1979, 2950494; Oct. 22, 1980, 3039833
Int. Cl.³ B27G 13/00
U.S. Cl. 144—230 6 Claims



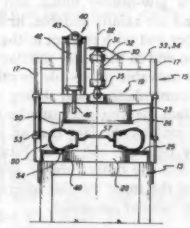
1. A cutter for wood chippers on which the chip separation surface formed with chip separator tips for chip separation, characterized by a plurality of connected single profile pieces of essentially L-shaped cross-section their short legs forming a rib and their long legs forming cutting edges of the cutter, the base of said cutter being provided with slots which aee open on one side, and a central depression in in said slot for receipt of a releasable clamping device for affixing the cutter to a holder.

4,355,674

APPARATUS FOR SEPARATING CASINGS FROM TIRE RIMS

Joseph F. Grasso, 119 Ridge St., Rome, N.Y. 13440

Filed Jan. 23, 1981, Ser. No. 227,627
Int. Cl.³ B60C 25/06
U.S. Cl. 157—1.2 10 Claims



1. Apparatus for separating a casing from the rim of a wheel that includes

a worktable for supporting a tire in a horizontal position thereupon, said worktable further having a circular opening passing therethrough that has a diameter greater than the outer diameter of the wheel rim and smaller than the outer diameter of the casing,

a cylindrical clamping tool for passing over the outer periph-

ery of the rim and securely locking the casing against the top surface of the worktable,

drive means connected to the cylindrical clamping tool for moving the tool between a loading position over the top of the table wherein a wheel may be positioned over the opening in the worktable and a clamping position wherein the lower edge of the clamping tool securely locks the casing against the table, and

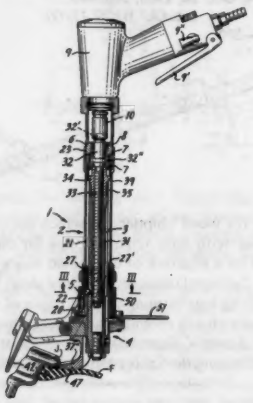
an extendable bar positioned over the opening in the worktable that is arranged to move downwardly into the opening formed in said table to force the rim of a wheel positioned upon the worktable downwardly through the opening.

4,355,675

DEVICE FOR REMOVING A TIRE FROM ITS RIM

Raymond Freixinos, Chamalieres, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Filed Feb. 24, 1981, Ser. No. 237,759
Claims priority, application France, Feb. 26, 1980, 80 04288
Int. Cl.³ B60C *25/06*
U.S. Cl. 157—1.17 **12 Claims**



1. A device for removing a tire from a rim having at least one circumferential flange, said device, which comprises a fixed jaw, a movable jaw cooperating with the fixed jaw and a tire push member which is driven by a mechanism which assures its axial displacement with respect to the jaws, being characterized by the fact that it comprises outer and inner tubular assemblies which bear a jaw-holder block and are engaged one within the other and are axially slidable, limited by stops, with respect to each other and with respect to the jaw-holder block; by the fact that one end of the outer tubular assembly bears an articulation for the movable jaw while its other end is fastened to a motor which controls the axial sliding of the two tubular assemblies; by the fact that the inner tubular assembly bears the tire push member; and by the fact that an interlock system is interposed radially between the inner tubular assembly, the jaw-holder block and the outer tubular assembly in order to make the sliding of the inner tubular assembly subject to the sliding of the outer tubular assembly.

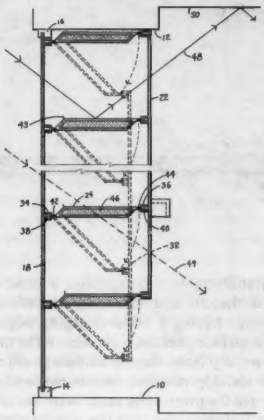
4,355,676

MOVABLE GLAZING AND INSULATION FOR WINDOWS

Kenneth S. Lee, 1711 Palomar, Ann Arbor, Mich. 48103

Filed Mar. 5, 1981, Ser. No. 240,925
Int. Cl.³ A47H *1/00*; E06B *3/32*
U.S. Cl. 160—107 **24 Claims**

1. A window assembly comprising an exterior glazing pane, an interior glazing pane spaced from said exterior pane and movable relative to said exterior pane, a plurality of louvers positioned between said exterior pane and said interior pane, a plurality of opposed parallel mullions extending from said exterior and interior panes, said mullions being parallel with



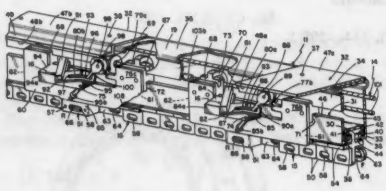
said louvers, said louvers being longitudinally attached to pairs of said opposed parallel mullions and including longitudinal hinge means to permit the movement of the interior pane relative to the exterior pane.

4,355,677

DRAPERY HANGER AND MANIPULATOR

Harold L. Madsen, 14615 Clark St., Dolton, Ill. 60419

Filed Aug. 17, 1981, Ser. No. 293,652
Int. Cl.³ A47H *1/00*
U.S. Cl. 160—126 **11 Claims**



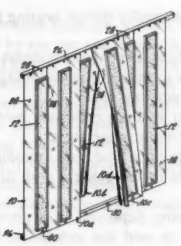
1. An improved drapery hanger and manipulator for supportably hanging and manipulating one or more drapery curtain panels having a leading and a trailing edge comprising a traverse track bridge to be positioned over an area to be covered by drapery, said bridge having a first track means therealong to slidably support a drapery hook hanger means, said bridge having a second track means therealong to slidably support a drapery carrier means, said bridge having cam means longitudinally spaced apart therealong, drapery hook hanger means slidably supported in said first bridge track for supporting drapery hooks slidably movable along said bridge to support the drapery panels from the leading to the trailing edge thereof, drapery carriers serially slidably supported in said second bridge track for independent movement along said bridge, said carriers having a hook extension connected to respective selected ones of said series of hook hangers to cause said selected hook hangers to respectively move with said carriers, a linear drive means having forward and reverse drive means for selectively providing forward and reverse linear drive along said bridge, said carriers having forward drive

receiving means adapted to sequentially receive forward drive from said linear drive means for respectively moving said panels by urging the leading edge along said bridge in a direction away from the trailing edge thereof, said carriers having reverse drive receiving means disconnectably and respectively receiving said reverse drive means to normally respectively drive said carriers in a reverse direction along said bridge for respectively moving said panels by urging the leading edge along said bridge in a direction toward the trailing edge thereof for collapsing said panels, a cam follower on one or more of said carriers and responsive to said cam means as said carriers are moved in reverse along said bridge for disconnecting respective reverse drive receiving means to selectively and respectively disconnect the reverse movement of said carriers from said linear drive means, and retainer means longitudinally spaced apart on said bridge respectively and progressively in the linear path of said drapery hook hanger means frictionally supporting and normally retaining and positioning the respective panel trailing edges along said first track to correspondingly retain and position said hook hanger means in groups along said bridge as said carriers are moved along said bridge, whereby said carriers can be driven in the forward direction by said forward drive means to sequentially position drapery curtain panels over a given drapery area, and in the reverse direction by said reverse drive means toward and against the frictional retention and position to individually respectively collapse said panels toward said frictionally positioned retainers or to withdraw said panels from the given area by continuous reverse movement to provide respective separate light openings for each panel or to selectively completely remove or collapse said panels from the given area.

4,355,678
ACOUSTIC STRIP CURTAIN

Paul L. Romano, Orange, Calif., assignor to Acoustic Standards, Orange, Calif.

Filed Mar. 3, 1981, Ser. No. 240,185
Int. Cl.³ A47H *1/00*
U.S. Cl. 160—332 **24 Claims**



1. An acoustic strip curtain comprising

a plurality of elongated curtain strip assemblies secured to and suspended from a support, all assemblies of a group of said assemblies hanging in side-by-side relation, each assembly of said group comprising

a flexible acoustic barrier sheet having first and second longitudinally extending outer sections and a longitudinally extending inner section,

an absorber panel of acoustic absorber material secured to said inner section of said sheet and extending longitudinally thereof, said panel having a thickness greater than the thickness of said sheet and having laterally facing longitudinally extending edges,

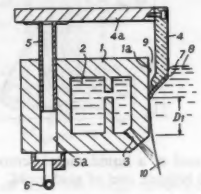
each outer section of a group of said barrier sheets overlapping an outer section of an adjacent sheet for substantially the entire length and width of such outer sections, and

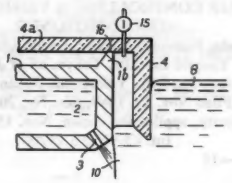
each sheet of said group having a longitudinally extending edge portion positioned adjacent an edge of the panel of an adjacent assembly of said group, whereby sound passing between overlapping outer sections passes around an edge of a barrier sheet in proximity to an absorber panel.

4,355,679
CASTING METALS

Rennie F. T. Wilkins, Chigwell, England, assignor to British Aluminum Company Limited, England

Filed Feb. 16, 1979, Ser. No. 12,765
Claims priority, application United Kingdom, Feb. 18, 1978, 6527/78
Int. Cl.³ B22D *11/04, 11/08*
U.S. Cl. 164—466 **37 Claims**





1. A method of direct chill casting of non-ferrous metals through a water cooled open mould having a mould wall and a rigid sleeve means of thermally insulating material which is movable within and relative to the mould wall in the direction of liquid metal flow to increase an overlap therebetween and in which, during the casting operation, liquid metal is supplied to the interior said rigid sleeve means, said sleeve means is moved and pressure is applied to a peripheral region of a pool of liquid metal in the mould so that the axial length of the mould wall in contact with the liquid metal is varied, independently of variations of the quantity of liquid metal within the sleeve means.

4,355,680
METHOD AND APPARATUS FOR CONTINUOUS CASTING OF HOLLOW ARTICLES

John G. Frantzreb, Sr., Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 3, 1980, Ser. No. 203,008
Int. Cl.³ B22D *11/10, 11/00*
U.S. Cl. 164—484 **10 Claims**

1. A method for the continuous casting of hollow articles **(12)**, comprising:

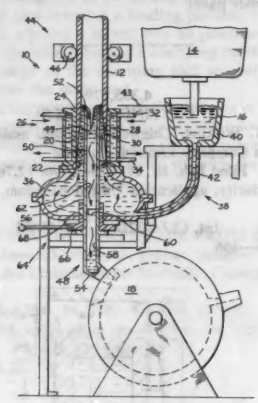
feeding molten metal **(16)** into a casting breech **(36)** disposed at a bottom end **(22)** of a vertically oriented mold **(20)**;

solidifying a first portion of the molten metal **(16)** in said mold **(20)** to form a hollow articles **(12)**;

withdrawing said hollow articles **(12)** from an upper end **(24)** of said mold **(20)**; and,

concurrently removing a liquid second portion **(49)** of said

molten metal (16) from the upper end (24) of said mold (20) and discharging said liquid second portion through a



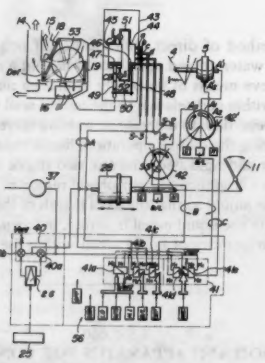
discharge end of a liquid metal removing means located below said bottom end of said mold.

4,355,681

SYSTEM FOR CONTROLLING A VEHICLE MOUNTED AIR CONDITIONER

Yukio Shimada; Naoyoshi Suzuki; Toshio Ohashi, all of Yokohama, and Yasushi Inoshita, Tokyo, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 12, 1980, Ser. No. 206,271
Claims priority, application Japan, Nov. 15, 1979, 54-147067
Int. Cl.³ F25B *29/00*
U.S. Cl. 165—16 **4 Claims**



1. A system for automatically controlling a vehicle mounted air conditioner having an air intake port for introducing outer air, cabin air or a mixture thereof, an air intake door controlling the source and mixture of the intake air, and a vacuum-operated air intake door actuator, a hot air passage, a cold air passage, an air mix door controlling the proportions of the intake air passing through the hot air passage and the cold air passage, and an air mixing door actuator, a plurality of blower outlets for conditioned air and a blower outlet door for each of said blower outlets, in which the flow of conditioned air through the outlets is in response to a controlling program of an automatic temperature adjusting system in either an automatic selection mode or a manual selection mode,

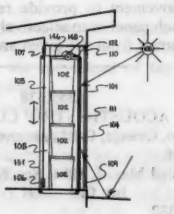
wherein the improvement is characterized in that the system comprises a mode controlling vacuum switch for placing the system in either the automatic selection mode or the manual selection mode, a controlling vacuum circuit system controlled by said vacuum switch for supplying a uni-directional vacuum signal and including said air intake door actuator, a shift actuator for actuating said blower outlet doors, and vacuum selectors for transmitting the vacuum signal from said vacuum switch to the shift actuator and the air intake door actuator, said vacuum selectors being controlled by a temperature-responsive power servo.

4,355,682

ENVIRONMENTALLY DRIVEN HEATING AND COOLING SYSTEM

Timothy Maloney, Winchester, Va., assignor to One Design, Inc., Winchester, Va.

Division of Ser. No. 941,735, Sep. 12, 1978, Pat. No. 4,257,477.
This application Aug. 18, 1980, Ser. No. 179,240
Int. Cl.³ F25B *29/00*
U.S. Cl. 165—48 S **12 Claims**



1. In an environmentally driven heating and cooling system, which includes:

wall means defining at least two containers each for a quantum of thermal storage mass, each including surface means for collecting and radiating heat;

each said container in a use condition having a filling of said quantum of thermal storage mass;

a building structure for a situs, and including a glazed portion sited for sunlight to fall along a path directly or indirectly thereon;

said containers being deployed in a group in said building structure when in said use condition, behind said glazed portion, relative to the path of sunlight falling on said glazed portion;

the improvement wherein:

the at least two containers further have a shipping condition wherein the at least two containers lack said filling and are more condensed relative to one another than when grouped, so that while being shipped to said situs in said shipping condition, said at least two containers occupy less space than when grouped and in said use condition;

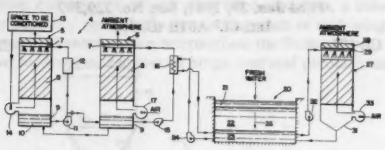
each container being an integrally molded unit made of synthetic plastic material and each includes sidewalls and a bottom cooperatively provided with a nesting feature and a stacking feature, so oriented that when two such containers are aligned and vertically juxtaposed in one congruent relationship, the upper one will nest in the lower one without the stacking feature of the lower one supporting the upper one, but when said two such containers are aligned and vertically juxtaposed in an opposite relationship, in which one is turned end-for-end relative to the other, the upper one will stack upon the lower one without substantial nesting.

4,355,683

SYSTEM OF MOISTURE AND TEMPERATURE CONDITIONING AIR USING A SOLAR POND

William C. Griffiths, Lebanon, N.J., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed May 11, 1981, Ser. No. 262,047
Int. Cl.³ F24F 3/14; F24J 3/02
U.S. Cl. 165—60 13 Claims



1. A system of moisture and temperature conditioning air, comprising:

(a) a first tower, comprising (I) means for simultaneously moisture and temperature conditioning air circulated through the tower, including distribution means adjacent the vertically uppermost top of the tower for directing liquid sorbent downwardly into contact with air circulating through the tower, and (II) a first sump adjacent the vertically lowermost bottom of the tower in which liquid sorbent, diluted with moisture, collects after it moves downwardly through the tower;

(b) a vertically elongated second tower in which diluted liquid sorbent is concentrated, the second tower being in spaced relation from the first tower and comprising, (I) means for evaporating water from the liquid sorbent into air circulated through the second tower, including distribution means for directing liquid sorbent into contact with the air, and (II) a second sump in which liquid sorbent collects after it moves downwardly through the second tower;

(c) means for circulating liquid sorbent between the first and second sumps;

(d) a solar pond, remote from the towers, including a liquid which is heated by the sun and in which heating energy is stored, the pond having a bottom which is spaced from an upper surface which is closer the sun, the liquid of the pond being a brine solution having a concentration of salt which increases with the depth of the pond;

(e) means for using heating energy from the solar pond to evaporate water from the sorbent brine into air circulated through the second tower; and

(f) means for maintaining the concentration of salt in the pond.

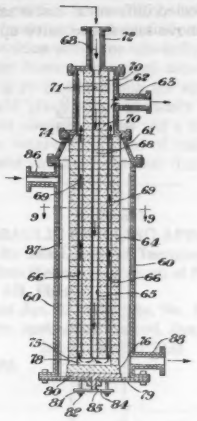
4,355,684

UNIAXIALLY COMPRESSED VERMICULAR EXPANDED GRAPHITE FOR HEAT EXCHANGING

Ronald S. Caines, Stone Mountain, Ga., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jun. 13, 1979, Ser. No. 48,127
Int. Cl.³ F28D 7/10; F28F 21/02, 3/08
U.S. Cl. 165—154 1 Claim

1. A heat exchanger comprising a cylindrical core member composed of a plurality of circular plates, each plate being composed of vermicular expanded graphite which has been compressed along an axis normal to the radius of said plate to a density of at least 100 pounds per cubic foot, means for compressing said plates in a fluid tight relationship against one another and along an axis normal to the radius of said plates, means for passing a first fluid in contact with said core member, and means for passing a second fluid through said core member in separate but heat exchanging relationship with said



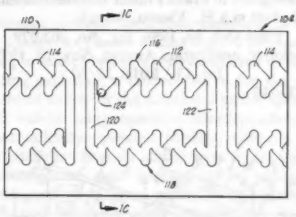
first fluid, the axis of heat exchange between the first and second fluids being along the radius of said plates.

4,355,685

BALL OPERATED J-SLOT

Harold K. Beck, Duncan, Okla., assignor to Halliburton Services, Duncan, Okla.

Filed May 22, 1980, Ser. No. 152,162
Int. Cl.³ E21B 23/00
U.S. Cl. 166—240 24 Claims



1. In a lug and slot assembly for guiding a relative movement between first and second telescoping tubular members of a downhole tool, the improvement comprising:

said slot having a semicircular cross section;

said lug being a spherical ball approximately one-half of which is received in said slot; and

biasing means for resiliently biasing said ball toward said slot, said biasing means including a displaceable fluid under pressure.

4,355,686

WELL SYSTEM AND METHOD

Henry P. Arendt, and Thomas J. Heard, both of Dallas, Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

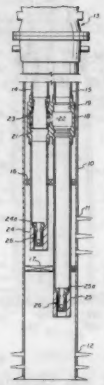
Filed Dec. 4, 1980, Ser. No. 212,994
Int. Cl.³ E21B 34/08
U.S. Cl. 166—313 8 Claims

1. The method of operating an injection well having a pair of tubing, an H-member in said pair of tubing with a pair of bores interconnected by a lateral passageway and a normally closed sliding sleeve valve in one bore controlling flow through said

lateral passageway, and landing nipples connected to each lower leg of the H-member, comprising,

landing a fluid control means in each landing nipple,

establishing a selected differential across said interconnecting means to move said sleeve valve upwardly to open position,



carrying out TFL procedures in said pair of tubing,

landing a plug in the valve member of said sleeve valve,

and establishing a selected pressure differential across said plug to close said sleeve valve and pump said plug through said sleeve valve.

4,355,687

BALLAST LEVELING APPARATUS AND METHOD

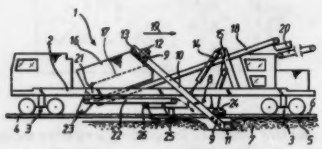
Josef Theurer, Vienna, and Karl Fölser, Linz-Urfahr, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Oct. 30, 1980, Ser. No. 202,079

Claims priority, application Austria, Nov. 23, 1979, 7461/79

Int. Cl.³ E01B *27/10*

U.S. Cl. 171—16 **10 Claims**



1. A ballast leveling apparatus mounted on a ballast cleaning machine including a frame and adapted to move in an operating direction on a track including ties resting on a ballast bed having two shoulders laterally adjacent the track, the machine frame supporting a ballast excavating means for removing ballast from a region of the ballast bed underneath the track, a ballast screening arrangement for separating the removed ballast into cleaned ballast and waste, and conveyor means for redistributing cleaned ballast to the excavated region of the ballast bed, and the ballast leveling apparatus being comprised of

(a) a pair of endless ballast leveling chains for distributing the redistributed cleaned ballast over the ballast bed and for leveling the distributed cleaned ballast,

(b) a vertical pivot supporting a respective one of the endless ballast leveling chains for pivoting inwardly from a respective one of the ballast bed shoulders in a plane underneath the track,

(c) a rotary drive for driving each ballast leveling chain, and

(d) a power drive linking each ballast leveling chain to the machine frame for vertically adjusting the ballast leveling chain independently of the ballast excavating means.

4,355,688

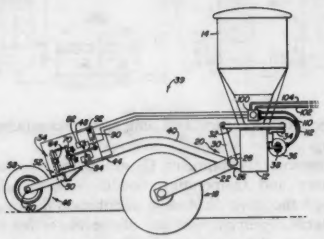
AGRICULTURAL IMPLEMENT AND DEPTH CONTROL THEREFOR

Nicholas Hamm, Vineland, and John Rosbak, Fonthill, both of Canada, assignors to Deere & Company, Moline, Ill.

Filed Jan. 29, 1981, Ser. No. 229,399

Int. Cl.² A01B *63/114*

U.S. Cl. 172—4 **12 Claims**



1. In an earthworking implement, a main frame supported for forward movement over the ground, an earthworking tool assembly having a tool frame and soil penetrating tools connected to the tool frame, means for rockably connecting the tool frame to the main frame, power means for rocking the tool frame to raise and lower the tools with respect to the main frame to vary the depth of penetration of the tools, a fore-and-aft extending support arm fixed at one end to the tool frame forwardly of the soil penetrating tools for rocking therewith and extending rearwardly from said one end up and over the soil penetrating tools to an opposite end thereof spaced rearwardly from the tool assembly, said opposite end movable vertically as the tool frame is raised and lowered, depth gauging means extending downwardly from said opposite end of the support arm so as to be movable into contact with the soil for sensing the position of the arm relative to the ground, said depth gauging means comprising a wheel connected to said opposite end of the arm for castering about an upright axis and for rocking vertically about a generally horizontal transverse axis adjacent the upright axis as the support arm rocks, and means responsive to the rocking of the caster wheel about said transverse axis for providing a signal indicative of whether the depth of penetration of the tools is above or below a preselected range, and wherein said power means is responsive to the signal for rocking and tool frame to maintain the depth of penetration of the tools within the preselected range.

4,355,689

FLEXIBLE WING IMPLEMENT WITH UNIVERSAL HINGES AND SELECTIVE LOCKING STRUCTURE ASSOCIATED WITH WINGS THEREOF

Terrance Friggstad, Frontier, Canada, assignor to Friggstad Manufacturing Ltd., Saskatchewan, Canada

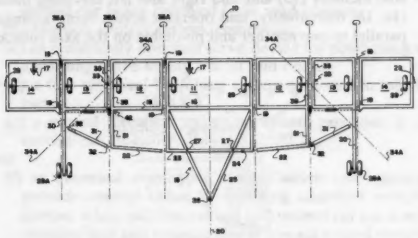
Continuation-in-part of Ser. No. 902,120, May 2, 1978, abandoned, which is a continuation-in-part of Ser. No. 807,556, Jun. 17, 1977, abandoned. This application May 5, 1980, Ser. No. 146,408

Int. Cl.³ A01B *73/00*

U.S. Cl. 172—311 **32 Claims**

21. A ground working implement comprising in combination a center section, a hitch assembly extending forwardly from said center section, at least one wing section upon each side of said center section, movable from a field working position to a transport position and vice-versa, said each of said wing sections including an inner side and an outer side, the inner side of said wing sections being adjacent said center section, a wing

hitch member extending forwardly from the outer side of each of said wing sections, a transverse hitch member extending between the distal end of said wing hitch member and said hitch assembly of the center section, means for pivotally connecting one end of said transverse hitch member to the distal end of said wing hitch member and the other end of said transverse hitch member to said hitch assembly of said center section, ground engaging wheels supporting each of said wing sections and said center section and a castor wheel assembly on the front end of each of said wing hitch members, a universal hinge assembly operatively connecting each of said wing sections to said center section intermediate the front and rear sides of said sections, said universal hinge, and said pivotal connecting means between said corresponding transverse hitch member and said hitch assembly of said center section, lying on a first axis parallel to and spaced from the central fore and aft axis of said center section; the pivotal connecting means are between said corresponding transverse hitch member and said wing hitch member; and said universal hinge lying on a second axis extending diagonally between said last mentioned pivotal connecting means and said universal hinge, and means to selectively lock and release said wing sections relative to the center section such that each of said wing sections is free to pivot around said first and second axis when in the ground working position but are restricted to pivot around said first axis only, prior to and during movement of said wing sections towards said transport position.

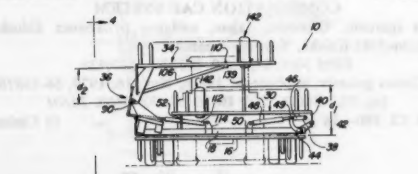


4,355,690

STACK FOLDING OUTRIGGER SYSTEM

Thomas C. Jensen; Phillip E. Stevens, and Henry J. Landry, Jr., all of Ankeny, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Dec. 18, 1980, Ser. No. 217,717
Int. Cl.³ A01B *73/00*
U.S. Cl. 172—311 **20 Claims**



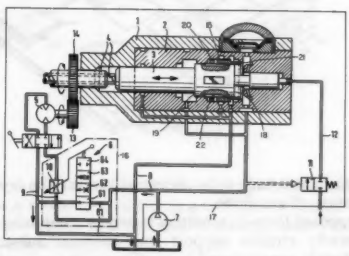
3. In a foldable farm implement adapted for forward movement over the ground and having a laterally extending horizontal main frame with first and second ends and first and second transverse outrigger frames with depending earth-working tools, first means hingedly connecting the first outrigger frame to the first end of the main frame for swinging about a first axis between a transversely outward working position with the tools extending in a downwardly direction with respect to the main frame and a storage position above and parallel to the main frame with the tools extending in an upwardly direction a first distance above the main frame, and second means hingedly connnecting the second outrigger frame to the second end of the main frame for swinging between a working position transversely outwardly of and parallel to the main frame and a substantially transverse and horizontal storage position above the upwardly extending tools on the first outrigger frame, said second means including a fore-and-aft extending pivot connecting the second outrigger and main frames, said pivot offset vertically a second distance above the second outrigger frame and a third distance above the main frame, wherein the total of said second and third distances is at least equal to or greater than said first distance.

4,355,691

HYDRAULIC DRILLING APPARATUS

Esa Karru; Pekka Salmi, both of Tampere; Hannu Paasonen, Nokia, and Aimo Helin, Tampere, all of Finland, assignors to Oy Tampella AB, Finland

Filed Jun. 23, 1980, Ser. No. 162,160
Claims priority, application Finland, Jun. 26, 1979, 792018
Int. Cl.³ B25D *9/26*
U.S. Cl. 173—106 **5 Claims**



1. A hydraulic drilling apparatus, especially a rock drill, comprising a body, a cylinder in said body, a percussion piston reciprocating in said cylinder, a tool connected to said body, a motor rotating said tool, a control valve for the percussion power, a control valve for the rotational motor speed, both of said control valves being operated interdependently by one lever, a hydraulically operated flushing valve, a hydraulic pump and hydraulic channels which form a percussion circuit and a rotation circuit, said rotation circuit being parallelly coupled with said percussion circuit and operatively connected with said hydraulic pump, a flushing valve circuit controlled by said percussion circuit, and a free circulation circuit operatively connected with said hydraulic pump, said circulation circuit being parallelly coupled with said percussion circuit.

4,355,692

THICK FILM RESISTOR FORCE TRANSDUCERS AND WEIGHING SCALES

Michael J. Ostrelich, Easton, Conn., assignor to General Electric Company, New York, N.Y.

Filed Nov. 24, 1980, Ser. No. 209,749
Int. Cl.³ G01G *3/14*; G01L *1/22*
U.S. Cl. 177—211 **4 Claims**

1. Means for measuring a force between at least two opposed force-transmitting members comprising:

a mechanical force to electrical signal transducer comprising:

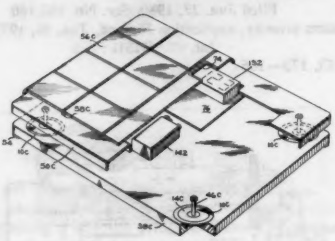
a thin flexible circular wafer of substantially uniform thickness including a flexible metal substrate member, said circular wafer having a central depression therein,

at least a part of one surface of said substrate member being flat and being comprised of an electric insulating material, and

a resistance element fused upon said electrical insulating material to form an integral part of said flexible member, said resistance element comprising a substantially uniform thickness of a thick film resistor ink of the type used for thick film integrated circuits, the resistance of said resistance element varying in a predictable manner with strain applied to said flexible body, said film layer comprising a substantially circular pattern surrounding and centered upon said central depression, and

means for mounting and positioning said circular wafer in a plane substantially perpendicular to the direction of the force to be measured, said mounting means including means positioned to engage the outer peripheral edges of said wafer body to confine said body within said mounting means,

said force-transmitting members including force-transmitting elements engaging the flat faces of said wafer body respectively on opposite sides thereof to provide bending



stress in said body to be measured by said film layer as a measure of said force,

said opposed force-transmitting members comprising a substantially circular support shelf member substantially uniformly engaging and supporting one face of said wafer near the outer peripheral edge thereof outside of said film layer and a pin member engaging the opposite face of said wafer at said central depression, the end of said pin member being shaped and dimensioned to fit into said central depression,

the position of said resistance element upon said body and the positions of engagement of said force-transmitting elements with said body thereby being arranged to be mutually exclusive so that said force-transmitting elements do not directly engage the portion of said body upon which said resistance element is formed,

whereby the force applied to said flexible body may be measured by sensing the change in resistance of said resistance element in response to the application of the force.

4,355,693

WORKING VEHICLE

Masami Hirooka, Sakai, and Denzaburo Harada, Katano, both of Japan, assignors to Kubota Ltd., Japan

Filed Nov. 13, 1980, Ser. No. 206,449

Claims priority, application Japan, Sep. 29, 1980, 55-139201[U]

Int. Cl.³ B62D *11/00*

U.S. Cl. 180—6.48 **4 Claims**

1. In a working vehicle having right and left traveling means (*1a, 1b*) adapted to be driven and stopped simultaneously or individually to effect traveling and turning round of the vehicle, traveling speed changing means (**8**) for providing a high speed drive and a low speed drive and including an operator member (*8a*), and switch means (**13**) adapted to automatically and reversibly switch the traveling speed changing means (**8**) from a position to provide the high speed drive to a position to provide the low speed drive when the vehicle traveling straight turns round, said switch means (**10**) comprising,

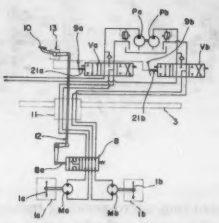
a high speed switching panel (**10**) operatively connected to said operator member (*8a*) of said speed changing means (**8**),

resilient control means (**14**) operatively connecting said pedal (**10**) to said operator member (*8a*) to permit said speed changing means (**8**) to move to the position to provide the low speed drive when said pedal (**10**) has been operated for the high speed drive,

a pivotable member having first and second ends and being pivotable on an axis intermediate and first and second ends,

said pivotable member (**15**) being operatively connected to said operator member (*8a*) at said first end,

right and left operator levers (*9a, 9b*) pivotable on axes aligned to one another and adapted to operate said pivotable member (**15**) and said right and left traveling means (*1a, 1b*) individually, said operator levers being arranged parallel to one another and pivotable on the axes substan-



tially parallel to the pivotal axis (Y) of said pivotable member (**15**),

a pair of cam follower means (a, a') connected to said second end of said pivotable member (**16**) to be opposed to one another relative to said pivotal axes (X) of said operator levers (*9a, 9b*) and adapted to be oscillatable respectively on axes (Z1, Z2) substantially parallel to the axis (Y) of said pivotable member (**15**), and

cam means (b, b') connected to said right and left operator levers (*9a, 9b*) respectively and adapted to act on said cam follower means (a, a') to move said speed changing means (**8**) to the position to provide the low speed drive when said operator levers (*9a, 9b*) are oscillated relative to one another during high speed running of the vehicle and to move said speed changing means (**8**) to the position to provide the high speed drive when said operator levers (*9a, 9b*) are oscillated in the same direction.

4,355,694

TRANSMISSION CONTROL SYSTEM FOR A COMBINATION CAR SYSTEM

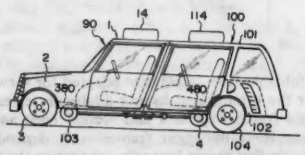
Isao Igarashi, Okazaki, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Nov. 17, 1980, Ser. No. 207,428

Claims priority, application Japan, Nov. 16, 1979, 54-158752

Int. Cl.³ B60D *7/00*; B62D *63/00*; B60K *26/04*

U.S. Cl. 180—14 R **11 Claims**



1. In a combination car system, comprising:

(a) a first car, capable of running independently, comprising a first pair of front wheels, a first pair of rear wheels, a first

engine, and a first transmission which drivingly connects said first engine to said first pair of front wheels; and

(b) a second car, capable of running independently, comprising a second pair of front wheels, a second pair of rear wheels, a second engine, and a second transmission which drivingly connects said second engine to said second pair of rear wheels, and which is an automatic transmission, comprising a range switching valve, which can be set at least to N, D, L, and R ranges according to the position of said switching valve;

(c) said first car and said second car being couplable together into a coupled car which runs on said first pair of front wheels of said first car and said second pair of rear wheels of said second car, with said first pair of rear wheels of said first car and said second pair of front wheels of said second car being removed from road contact:

a transmission control system, comprising:

(c) an electrically operated servo device for positioning said switching valve to any one of said ranges;

(d) a first electrical switching system provided in said first car;

(e) a second electrical switching system provided in said second car;

and

(f) an electrical connecting system which can selectively provide control either by said first electrical switching system, when said first car and said second car are coupled together into said coupled car, or by said second electrical switching system, when said second car is running independently, to said electrically operated servo device so as to control it;

(g) whereby, when said first car and said second car are coupled together into said coupled car, the operation of said second transmission of said second car may be controlled from said first car by operation of said first electrical switching system, the controlling operation of said second electrically operated switching system being at this time unavailable.

4,355,695

ARTICLE RESTRAINING DEVICE

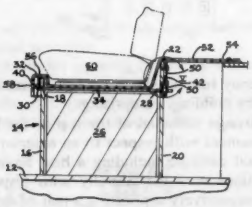
Edward V. Leskovec, Eastlake, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

PCT No. PCT/US80/01396, § 371 Date Oct. 20, 1980, § 102(e) Date Oct. 20, 1980, PCT Pub. No. WO82/01353, PCT Pub. Date Apr. 29, 1982

PCT Filed Oct. 20, 1980, Ser. No. 228,812

Int. Cl.³ B60K *1/04*

U.S. Cl. 180—68.5 **19 Claims**



1. An article restraining device (10) for a removable component (26) of a vehicle having a main frame (12), comprising:

a cover (52) attached to said vehicle and movable to an operating position overlying said removable component (26);

an enclosure frame (14) having a pair of spaced upwardly extending frame members (16,20) connected to said main frame (12), one of said pair having a first aperture (30) disposed therein and the other of said pair having a second aperture (28) disposed therein; and

restraining means (34) movable to a restraining position at which it passes through said apertures (30,28) and overlies said removable component (26), said restraining means (34) permitting movement of said cover (52) to said operating position only when said restraining means (34) occupies said restraining position.

4,355,696

AXLE SUSPENSION FOR THE DRIVEN AXLE OF A ROAD VEHICLE

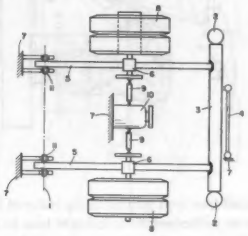
Hans Moll, Gräfelfing, Fed. Rep. of Germany, assignor to M.A.N. Maschinenfabrik Augsburg Nurnberg Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 8, 1980, Ser. No. 176,299

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1979, 2932685

Int. Cl.³ B60G *9/002*

U.S. Cl. 180—73 TL **6 Claims**



1. In an axle suspension for the driven axle of a road vehicle such as a motor bus, including a subframe arranged between the drive wheels and the vehicle body of said vehicle; the improvement comprising:

(a) said subframe including a torsionally flexible, flexurally rigid cross support member; and a pair of axial trailing links, one end of each of said links being rigidly connected in a cranklike manner proximate each end of said member;

(b) means supporting the free ends of said axial trailing links on the vehicle body for pivotal movement about a transverse axis; and a track bar to provide support for said subframe in the vehicle body;

(c) wheel bearings for said drive wheels being arranged approximately in the central region of said axial trailing links;

(d) and a differential being fastened to said vehicle body; and double cardan shafts connecting said differential with said wheels.

4,355,697

VEHICULAR STEERING AND SUSPENSION SYSTEM

Nicolae V. Orlandea, Davenport, Iowa, and Jack C. Wiley, Moline, Ill., assignors to Deere & Company, Moline, Ill.

Filed Sep. 2, 1980, Ser. No. 183,536

Int. Cl.³ B60K *17/30*

U.S. Cl. 180—261 **23 Claims**

1. In a vehicle having a frame, a differential, a pair of power shafts which extend coaxially and laterally outward from opposite sides of said differential, and a pair of drive wheels, a steering and suspension system comprising:

(a) an elongated gear case pivotally supported at one end on each of said power shafts;

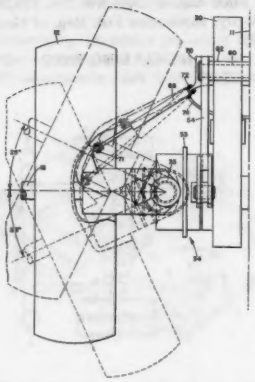
(b) a gear train contained within each of said gear cases including an input gear fixed to said power shaft, an output gear, and an intermediate gear meshing with both said input and said output gear;

(c) a drive shaft extending laterally outward from a second end of each of said gear cases, said drive shaft supporting said output gear;

(d) a first support member movably mounted to said second end of each of said gear cases, said support member coaxially aligned with said drive shaft;

(e) a second support member pivotally mounted on each of said first support members for movement about a steering axis;

(f) support means for maintaining the steering axis in a fixed direction with respect to said frame, said support means including first and second arms, said first arm extending outward from said first support member and said second arm pivotally connected at its ends to said first arm and to said frame;



(g) an axle connecting each of said drive wheels to each of said respective second support member;

(h) bevel gears adjacently mounted on an end of each of said drive shafts and on an end of each of said axles;

(i) a pair of idler gears rotatably mounted on each of said first support members for rotation concentric about said steering axis, said pair of idler gears meshing with said bevel gears; and

(j) extending and retracting control means joining each of said second support members to said frame for moving said second support members about said steering axis and thereby angularly turning said drive wheels with respect to said frame.

4,355,698

BRAKE AND TRANSMISSION CONTROL

Charles A. Barnes, Bellevue; Dean E. Davis, Battle Creek, and Carl L. Wykoff, Jackson, all of Mich., assignors to Clark Equipment Company, Buchanan, Mich.

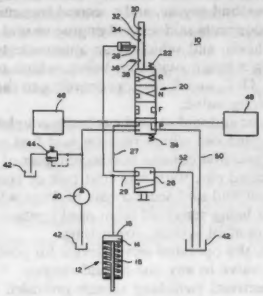
Filed Jul. 21, 1980, Ser. No. 170,360
Int. Cl.³ B60T 7/02
U.S. Cl. 180—273 **4 Claims**

1. A brake and transmission control system for a vehicle having a spring applied fluid pressure released brake, a fluid pressure controlled transmission including a control valve with a neutral position and at least one operating position and biased to the neutral position, and a source of pressurized fluid, comprising

a two position valve having an operating position and a drain position,

a fluid pressure actuated detent arranged to hold the control valve in the operating position when energized, and

conduit means connecting both said brake and said detent to be energized from said source when said two position valve is in the operating position and when said two position valve is then moved to its drain position said detent is deenergized causing said control valve to move from the



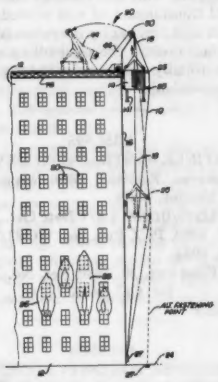
operating position to the neutral position and remain there until it is moved manually.

4,355,699

EMERGENCY RESCUE SYSTEM

Charles P. Smith, Jr., 336 N. Palm Dr., Beverly Hills, Calif. 90210

Filed Nov. 24, 1980, Ser. No. 209,708
Int. Cl.³ A62B 1/02
U.S. Cl. 182—12 **16 Claims**



1. An emergency rescue system for use in rescuing persons from a multistory building, comprising:

a movable carriage mounted at the top of the building for lateral movement with respect to an exterior face of the building, said carriage including a base having first and second sections movable laterally with respect to each other and respectively supporting a pair of davits extending upwardly generally in parallel for pivoting movement between an operative position overhanging the exterior face of the building and an inoperative position pivoted away from the exterior face of the building, each of said davits including a pulley mounted near its upper end;

a gondola for suspension alongside the exterior face of the building;

a pair of suspension cables extending respectively between said first and second sections of said movable carriage over said pulleys on said davits and connected to said gondola whereby said gondola is suspended from said carriage;

means on said carriage for adjusting the length of said sus-

pension cables for adjusting the elevational position of said gondola;

means for urging said gondola into bearing engagement with the exterior face of the building; and

means for laterally moving said carriage to adjust the lateral position of said gondola;

said carriage further including means for driving said first and second sections of said carriage base relatively away from each other to spread said davits and facilitate swinging movement of said davits between said operative position with said gondola overhanging the exterior face of the building and said inoperative position with said gondola on top of the building, and for driving said first and second sections back toward each other.

4,355,700

MODULAR STAIRWAY SYSTEM FOR INSTALLATION ON STRUCTURES HAVING NON-LINEAR WALLS

Wesley D. Matthews, and Floyd G. Matthews, both of R.R. 1, Mechanicsburg, Ill. 62545

Filed Feb. 17, 1981, Ser. No. 235,089
Int. Cl.³ E06C *9/02*; E04F *11/00*
U.S. Cl. 182—83 **7 Claims**

1. A modular stairway system for structures having non-linear walls comprising:

a plurality of first stringer means each having first connecting means integral therewith at opposite ends thereof for joining the first stringers;

a plurality of second stringer means horizontally spaced from and substantially parallel to the first stringer means each having adjustable second connecting means integral therewith at opposite ends thereof for adjustably joining the second stringers such that the combination of first and second stringers conform to the curvature of the structure;

a plurality of stairs horizontally interposed between the first and second stringers;

mounting means for securing the first and second stringers to the structure;

whereby the stairway system may be easily installed on structures having non-linear walls.

4,355,701

LADDER

Agnew W. Nicholson, 21 Nipigon Ave., Willowdale, Ontario, Canada

Filed Aug. 18, 1980, Ser. No. 178,909
Int. Cl.³ E06C *9/10*
U.S. Cl. 182—97 **13 Claims**

1. A lightweight, compact, marine ladder assembly including:

a ladder member and a supporting bracket to mount the assembly on the stern of a marine vessel,

said ladder member comprising an elongated tubular pole having first and second ends,

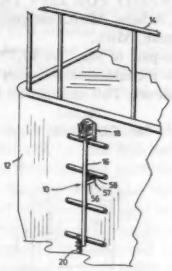
a plurality of spaced apart tubular rung members extending transversely of said tubular pole between said first and second ends, said rung members being mounted on said tubular pole at the middle of their axial length such that each rung member forms a pair of tubular rungs extending transversely of said tubular pole, in opposite directions,

said rungs including grip means over at least a portion of their outer surface to counteract hand and foot slippage,

a stand-off on said tubular pole adapted to abut said stern and support said ladder member outwardly of the vessel,

a tubular hinge member extending transversely of said pole on said first end,

said supporting bracket comprising a base wall adapted to be mounted on the stern, and a pair of spaced apart bracket arms extending substantially perpendicularly of said base



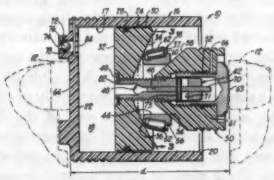
wall, said bracket arms having opposed facing inner walls, and each of said bracket arms including an arm wall defining a curved pivoting and load bearing surface for engagement with said tubular hinge member, to pivotally mount said ladder member in said supporting bracket for movement between a raised and a lowered position of the ladder member and to support the ladder member and a load on the rungs thereof, when said ladder member is in the lowered position extending generally downwardly from the supporting bracket, and guide means on said tubular hinge member to prevent lateral movement of the hinge member out of engagement with said arm walls.

4,355,702

METHOD AND APPARATUS FOR INJECTING VISCOUS MATERIALS

William E. Shultz, 239 N. Main St., Lombard, Ill. 60148

Continuation of Ser. No. 115,062, Jan. 24, 1980, Pat. No. 4,345,667. This application Oct. 13, 1981, Ser. No. 310,539
The portion of the term of this patent subsequent to Sep. 25, 1996, has been disclaimed.
Int. Cl.³ F01M *11/00*; F16N *3/10*
U.S. Cl. 184—1 D **5 Claims**



1. An assembly for packing wheel bearings and the like comprising:

a cylindrical housing including a first closed end and a second open end;

a piston adapted to be inserted into said housing said piston further including a first planar side and a second concave side;

a stem secured to said piston and the like from said first side

of said piston to said second means for communicating grease and the like;

a spool slideably mounted on said stem including a conical end; and

said bearing being positioned between said second side of said piston and said conical end of said spool during said packing.

4,355,703

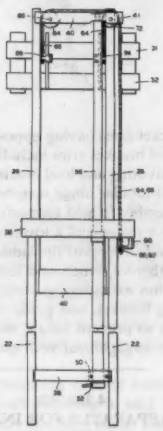
UPRIGHT FOR LIFT TRUCK

Richard J. Bartow, Athens, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Continuation-in-part of Ser. No. 17,779, Mar. 8, 1979, abandoned, which is a continuation-in-part of Ser. No. 842,765, Oct. 17, 1977, abandoned. This application Apr. 9, 1979, Ser. No. 28,292

Int. Cl.³ B66B *9/20*

U.S. Cl. 187—9 E **29 Claims**



1. In an upright structure for lift trucks and the like having one upright section including transversely spaced vertical rails, a telescopic upright section including transversely spaced vertical rails mounted for elevation relative to said one section and elevatable load carrier means mounted for elevation relative to said telescopic section, the improvement comprising a sole asymmetric lift cylinder assembly mounted in the upright structure which is operatively connected to said telescopic upright section, first and second flexible lifting elements reeved on first and second wheel elements and operatively connected to said cylinder assembly, to said one upright section and to said load carrier means, one end of each flexible lifting element being secured a substantial distance outwardly of one side only of the cylinder assembly, the other end of the first flexible lifting element being secured to said load carrier means adjacent the adjacent side of the upright and the other end of the second flexible lifting element being secured to said load carrier means adjacent the opposite side of the upright, said cylinder assembly together with said first and second flexible lifting elements being adapted to elevate said load carrier means relative to the telescopic upright section and the latter section relative to the one upright section, the lift cylinder being located substantially at one side of the upright structure such that it projects at least partially into the area of interference by an adjacent vertical rail with the visibility of the operator from his normal line of sight through said adjacent vertical rail.

4,355,704

PROCEDURE FOR FINE POSITIONING AN ALTERNATING CURRENT LIFT

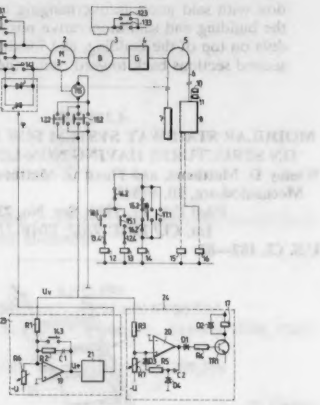
Heimo Mäkinen, Hyvinkää, Finland, assignor to Elevator GmbH, Zug, Switzerland

Filed Aug. 26, 1980, Ser. No. 182,409

Claims priority, application Finland, Aug. 28, 1979, 792674

Int. Cl.³ B66B *1/28*

U.S. Cl. 187—29 R **1 Claim**



1. An improved method for exact alignment of an elevator car with the floor level of a building, said elevator being driven by an alternating current drive motor connected to a speed control, the current in one or several phases of the elevator drive motor being choked with a controllable choke element, wherein the improvement comprises the steps of: governing elevator car control by a control unit receiving elevator car true velocity from a feedback control loop imparting fine adjustment to the elevator car running at a slow speed, stopping at a selected floor level within a required tolerance range; operating speed control of the drive motor only in a range in which counter-torque of said motor is positive, and when motor counter-torque is negative, controlling the velocity of the elevator car with the aid of a velocity measuring unit acting upon an elevator car brake.

4,355,705

GROUP CONTROL FOR ELEVATORS

Joris Schröder, Lucerne; Hans Bosshard, Würenlos; Jiri Kiml; Miroslav Kostka, both of Ebikon, and Walter Zimmermann, Buochs, all of Switzerland, assignors to Inventio AG, Hergiswil, Switzerland

Filed Nov. 24, 1980, Ser. No. 210,007

Claims priority, application Switzerland, Dec. 21, 1979, 11396/79

Int. Cl.³ B66B *1/18*

U.S. Cl. 187—29 R **16 Claims**

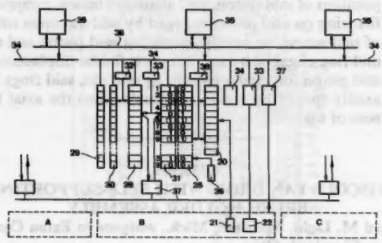
1. In a group control for elevators each having an elevator cabin and containing at least one storey call storage controllable by means of a storey call transmitter, cabin call storages for controlling by means of cabin call transmitters each cabin of the group, selectors operatively correlated with each elevator of the group indicating that storey at which the cabin still could stop, load measuring devices operatively correlated with each elevator cabin, a scanner device having at least one position for each storey, wherein each elevator is provided with a computer device possessing an adder which forms at least the distance between a considered storey and the selector position, the number of intermediate stops to be expected within such distance based upon the prevailing cabin and allocated storey calls as well as the momentary cabin load, a time-proportional

sum corresponding to the servicing capability of a cabin of the group with respect to the considered storey, and at least one comparison device by means of which the cabin having the lowest servicing costs corresponding to the smallest previously computated loss time and therefore the optimum servicing capability can be allocated to the considered storey, the improvement which comprises:

each elevator being provided with a computer device for counting the number of allocated storey calls and one of a number of cabin calls between a selector position and the considered storey;

each elevator further being provided with a device which stores the momentary operating state of the elevator cabins;

the computer device being provided with a subtractor unit for forming a difference from the number of said allocated storey calls multiplied by a number of passengers expected to enter the elevator cabin and the number of cabin calls



multiplied by a number of passengers expected to exit from the elevator cabin;

said difference and a momentary operating state of the elevator cabin being infeedable as a further summand to the adder of the computer device;

the scanner device being connected with the computer device which for each position of the scanner device forms the sum corresponding to the servicing costs of a cabin with respect to a real or imaginary storey call of such position;

a storage device connected with the computer device and the scanner device;

said storage device can be filled by means of said scanner device; and

said storage device receiving the correlations of the momentarily most optimumly employable cabin having the lowest servicing costs for the relevant position of the scanner device.

4,355,706

BICYCLE REAR BRAKE MOUNTED WITH SPROCKET WHEEL

Sheang Y. Pan, 5, Alley 146, Lane 114, Yen Huan E. Rd., Fong Yuan, Taiwan

Filed Oct. 20, 1980, Ser. No. 198,758

Int. Cl.[3] **B62L** *3/02;* **F16D** *55/16*

U.S. Cl. 188—24.11 **2 Claims**

1. A bicycle rear brake mounted with a sprocket wheel comprising:

a hub barrel member defining a first axial hole therein, said barrel having a narrower central neck portion and two wider end portions, a first end portion of the two end portions being provided with a first larger space which communicates axially with the outside and said first axial hole, the inner surface of the first portion slightly sloping in the axial direction to form a cone-shaped space, located between the cone-shaped space and the neck portion being a first bearing surface which has its axis aligned with that of said first axial hole; a second end portion of the two end portions being provided with a second larger space which communicates axially with the outside and said first axial hole, provided between the second larger space and the neck portion being a second bearing surface which has its axis aligned with that of said first axial hole, the outer surface of said second end portion being threaded, and defining a first annular groove and a slot, said annular groove being located between said neck portion and said threaded end, said slot intersecting said first annular groove;

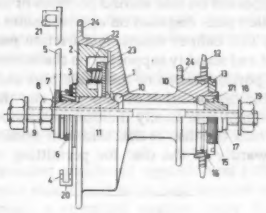
a pawl member having a second groove thereon corresponding to the first annular groove, the bottom of the pawl member being rotatably inserted in the slot by fixing a ring spring around the first annular groove and the second groove, the pawl member being so sustained that the pointed end of the pawl member may protrude out of the periphery of the first annular groove;

a sprocket wheel having an inner annular surface thereof provided with a ratchet which cooperates with the pawl member so that the sprocket wheel can drive or release the hub barrel;

means for hindering the movement of the sprocket wheel along the axial direction of the hub barrel;

an axle having two threaded end portions;

a first bearing cap member defining a second axial opening therein, the inner surface of the first bearing cap member being threaded so that the first bearing cap member can be threadably engaged to the axle and cooperate with the second bearing surface to form a first ball race;



a second bearing cap member defining a third axial opening therein, an end portion thereof being provided with a pocket, the outer surface of the other end portion thereof being threaded, the central portion thereof being provided with a block, the inner surface of the second bearing cap member being threaded so that the second bearing cap member can be threadably engaged with the axle and the pocket thereof can cooperate with the first bearing surface to form a second ball race;

a spring stop member defining an opening therein whose shape corresponds to the block so that the block can hinder the spring stop member from rotating around the axle;

a brake cone member defining an axial opening therein, said opening having a shape corresponding to the block so that the block can hinder the brake cone member from rotating around the axle, and a spring holder being provided therein for holding a spring so that as the brake cone member is pressed against the cone-shaped space of the hub barrel the spring is compressed against the spring stop member, such that upon release of the pressure, the brake cone member is returned to its original position, by the return force of the compressed spring;

a brake cone driving member defining an axial hole, the inner surface thereof being threaded for engagement with the second bearing cap to press against the brake cone member; and

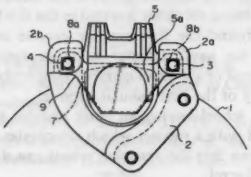
a brake arm member which can move the brake cone driving member back and forth along the axle.

4,355,707

DISC BRAKE WITH QUICKLY CHANGEABLE PADS

Kazuo Saito, Kawasaki, Japan, assignor to Tokico Ltd., Kawasaki, Japan

Filed Oct. 15, 1980, Ser. No. 197,326
Claims priority, application Japan, Oct. 20, 1979, 54-145234[U]
Int. Cl.³ F16D 65/12
U.S. Cl. 188—73.32 3 Claims



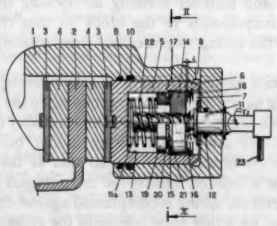
1. A disc brake comprising a holder adapted to be secured to a non-rotatable part of a vehicle and having two arm portions spaced in the direction of the circumference of a rotatable disc, said arm portions respectively straddling the outer circumferential edge of the disc, two guide pins respectively extending in the direction of the axis of the disc, each of said guide pins having a first portion and further having a second portion extending from one end of the first portion, the opposite ends of the first portion of each of the guide pins being supported on the respective arm portions of the holder, a caliper means slidably supported on said second portions of the guide pins, a pair of friction pads disposed on opposite sides of the disc and engaged by said caliper means, said friction pads each having a bifurcated end slidably supported on the intermediate portion of the first portion of one of the guide pins and the other end being slidable on the other of said pins, and the other of said pins being removable axially thereof for dismounting the friction pads from the disc brake, said arm portions being open radially inwardly of the disc for permitting removal of the pads.

4,355,708

DISC BRAKES

Robert P. Papagni, St. Remy-les-Chevreuse, France, assignor to S. A. Automobiles Citroen and S. A. Automobiles Peugeot, both of Paris, France

Continuation of Ser. No. 961,500, Nov. 17, 1978, abandoned.
This application Jul. 30, 1980, Ser. No. 173,455
Claims priority, application France, Nov. 23, 1977, 77 35976
Int. Cl.³ F16D 65/56
U.S. Cl. 188—196 D 2 Claims



1. In a disc brake wherein a yoke straddling a disc forms a cylinder in which a hollow piston with an open end remote from the disc and a closed end proximal to the disc is axially displaceable under fluid pressure toward said disc to clamp the latter between a pair of friction linings respectively carried by the piston and by the yoke, there being further provided a mechanical brake actuator including a rotatable large-pitch screw extending axially within the cylinder and engaging a nut inside said piston adjoining an axially shiftable locking ring nonrotatably secured to the piston, said nut and said locking ring having confronting faces formed with interengaging first and second ratchet teeth, rotation of said screw in a predetermined direction causing an axial shaft of said nut toward said disc with entrainment of said piston, fluidic displacement of said piston toward said disc with said screw stationary causing relative rotation of said nut and said locking ring with compensation of wear of said linings by a realignment of their ratchet teeth,

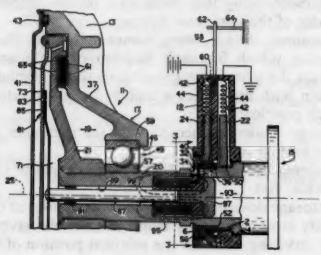
the improvement wherein said locking ring is separated from the closed end of said piston by a compression spring tending to maintain said confronting faces in contact with each other, said piston being provided with abutment means enabling limited relative axial displacement of said nut between two positions separated by an operating clearance, said screw being provided with means preventing axial displacement thereof relative to said yoke in all positions of said piston, said abutment means comprising a first ring on said piston engaged by said nut upon rotation of said screw for axially entraining said piston and a second ring engaged by said nut upon fluidic displacement of said piston for axially entraining said nut, said rings being axially spaced by a distance greater than the axial thickness of said nut.

4,355,709

VISCOUS FAN DRIVE WITH SELF-SUPPORTING BRUSH HOLDER ASSEMBLY

Gerard M. Light, Marshall, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jul. 9, 1980, Ser. No. 167,086
Int. Cl.³ F16D 35/00, 43/25; H01R 39/38
U.S. Cl. 192—58 B 25 Claims



1. A self-supporting brush holder assembly for transmitting power to a rotatable commutating ring disposed on the cylindrical outer surface of a shaft assembly comprising a first portion having a generally C-shaped concave surface and a second portion having a generally C-shaped concave surface which is adaptable to mate with said generally C-shaped concave surface of said first portion to define an annular surface defining a cylindrical opening having its longitudinal axis adapted to be disposed coaxial to said axis of rotation, said cylindrical opening defined by said annular surface being adapted to surround said cylindrical outer surface of the shaft with said annular surface being disposed contiguous to the cylindrical outer surface of said shaft and supporting said first and second portions on the shaft to prevent radial movement between the shaft and said first and second portions, channel means located on one of said first and second portions and disposed in a generally radial direction relative to the axis of rotation, brush means located in said channel means and being biased in a radially inwardly direction to engage with the commutating ring located on the shaft, a surface projection disposed on one of said annular surface or said cylindrical outer surface of the shaft and an indentation disposed on the

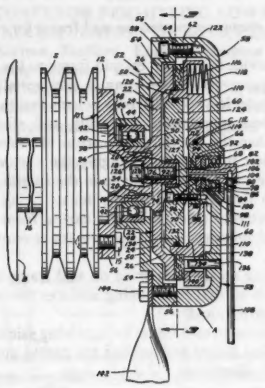
other of said annular surface or the cylindrical outer surface of the shaft, said projection cooperating with said indentation to positively locate said brush holder relative to the shaft and prevent movement in the axial direction therebetween.

4,355,710

SPRING ENGAGED FLUID RELEASED FAN CLUTCH FOR A LIVE SHAFT

Hugh K. Schilling, St. Paul, Minn., assignor to Horton Industries, Inc., Minneapolis, Minn.

Filed Aug. 25, 1980, Ser. No. 180,846
Int. Cl.³ F16D *13/44, 25/063*
U.S. Cl. 192—91 A 11 Claims



1. A spring engaged fluid released fan clutch for a live shaft comprising:

(a) a sheave for connection with a live shaft,

(b) means connecting said sheave to a friction disc,

(c) a first outer shell portion,

(d) means rotatably mounting said first outer shell portion on said connecting means,

(e) a second outer shell portion connected to said first outer shell portion,

(f) an annular piston, having a friction facing mounted thereon,

(g) means slidably mounting said piston on a hub connected to and within said second outer shell portion,

(h) a cylinder plate spaced from said piston and forming a cylinder cavity therebetween,

(i) means rotatably mounting said cylinder plate on said friction disc,

(j) means connecting said hub of said second outer shell with said cylinder plate,

(k) means rotatably mounting said second outer shell portion on fluid introducing means,

(l) fan blades connected to said first shell portion, radially and directly adjacent of said means rotatably mounting said first outer shell,

(m) a multiplicity of springs,

(n) means mounting said springs on said piston in pressure contact with said second outer shell portion thereby urging said friction facing on said piston into pressure contact with said friction disc whereby said shell portions and said blades thereon rotate with said sheave,

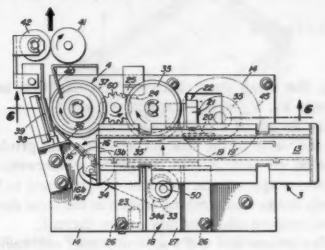
(o) means for supplying fluid pressure to said fluid introducing means and into said cylinder cavity whereby said piston is moved from said cylinder plate and said friction facing thereon is moved out of contact with said friction disc against the urging of said spring whereby said shell portions and fan blades thereon cease to rotate.

4,355,711

BANK NOTE DEPOSITING DEVICE FOR A TRANSACTION MACHINE

Minoru Hirose, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 6, 1980, Ser. No. 147,281
Claims priority, application Japan, May 15, 1979, 54-59299
Int. Cl.³ G07F *7/04*
U.S. Cl. 194—4 C 13 Claims



1. A bank note depositing device for a transaction machine comprising:

a cabinet having a depositing inlet through which at least one bank note is deposited into said transaction machine;

a storing means positioned within said cabinet and adjacent said depositing inlet for temporarily storing the bank notes entering said machine through said depositing inlet, said storing means having an oulet through which said notes are discharged;

a discharge roller means for discharging the notes from said storing means, said discharge roller means movable between a retracted position our of contact with said notes and an extended discharging position in contact with said notes;

a support member positioned opposite said roller means on the opposite side of said notes, said support member movable between a retracted position away from said discharge roller means and an extended discharge position toward said roller means to urge said notes into contact with said roller means; and,

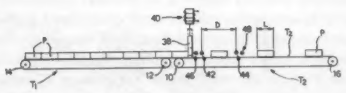
said storing means comprising a closure means positioned adjacent said outlet for opening and closing said outlet.

4,355,712

APPARATUS FOR FEEDING PRODUCTS TO A WORK STATION

Carlo L. Bruno, Oundle, England, assignor to Alisyncro S.a.s. di Bruno & C., Turin, Italy

Filed Mar. 10, 1980, Ser. No. 128,598
Claims priority, application Italy, Mar. 29, 1979, 67656 A/79
Int. Cl.³ B65G *47/26*
U.S. Cl. 198—460 6 Claims



1. Apparatus for feeding products in mutually spaced relation to a work station such that successive products are received thereby at substantially the same point of successive working cycles of the work station, said apparatus comprising:

(a) a first conveyor on which said products are received to form a longitudinal row thereupon in which adjacent products are touching,

(b) a second conveyor aligned with said first conveyor and having a loading end located adjacent a discharge end of said first conveyor, the second conveyor being arranged to feed products received from said first conveyor to said work station,

(c) first drive means selectively operable to advance the first conveyor at a first speed V_1 or at a second speed V_2, greater than the first speed V_1,

(d) second drive means operable to advance the second conveyor at a speed V_3 defined by the expression:

$$V_3 = V_M P_T / L$$

where:

V_M is the mean value between the said first and second speeds V_1, V_2 of the first conveyor,

L is the length of a said product, and

P_T is the value of the spacing between said products when located on said second conveyor at theoretical desired positions appropriate to cause the products to be successively fed to said working station at the same desired point of successive said working cycles thereof,

(e) a first sensor unit and a second sensor unit each arranged to detect the presence of a product at respective locations along said second conveyor, the first said sensor unit being positioned upstream of the second sensor unit and said locations being spaced from each other by a distance D defined by the expression:

$$D = L + 2(\Delta p/2)$$

where $\Delta p/2$ is equal to the maximum permissible offset between the actual position of a product on the second conveyor and its said theoretical desired position thereon; and

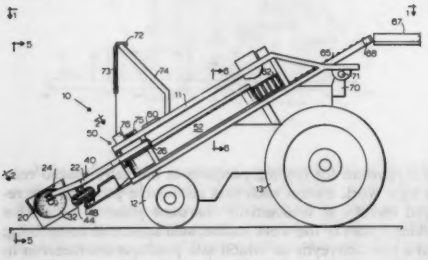
(f) control means operative to sample said sensor units at a frequency dependent on the speed of the second conveyor with each successive sampling taking place at the moment at which each successive product would, if in its said theoretical desired position on the second conveyor, be disposed midway between the two said sensor units, the said control means being arranged to control said first drive means to advance the first conveyor at its first speed V_1 when the second sensor unit detects the presence of a said product at a said moment of sampling and to advance the said first conveyor at its second speed V_2 when the first sensor unit detects the presence of a product at a said sampling moment.

4,355,713

DEVICE FOR LIFTING AND LOADING BOXES AND CARTONS, ESPECIALLY FROM AN AGRICULTURAL FIELD

Richard E. Adam, 914 E. Hermosa, Santa Maria, Calif. 93454

Filed Mar. 2, 1981, Ser. No. 239,679
Int. Cl.³ B65G 65/02
U.S. Cl. 198—514 **15 Claims**



1. Apparatus for lifting filled parallelepiped cartons with vertical side walls from an argicultural field, or the like, including in combination:

a wheel-supported main frame,

a pickup device at the forward end of said frame comprising a pair of facing discs supported for rotation on two generally vertical planes that converge rearwardly and downwardly, said discs being spaced apart from each other a distance such that at their forward and upper portions they are further apart than the width of the carton to guide it into the space between them and, later, to enable release from them, and at their rear and lower portions they are slightly closer together than the width of the carton, to grip it,

said discs having high friction faces for engaging said carton side walls,

first driving means supported on said frame for rotating said discs,

a gripping device supported by said frame to the rear of said pickup device and comprising a substantially coplanar pair of rotatable yieldable tired wheels facing each other and inclined rearwardly upwardly and slightly closer together than the width of the carton, the tires providing high friction surfaces for engaging the carton side walls and yielding to prevent damage to the carton while gripping them firmly, the gripping device being located so that it positively takes away the carton from the pickup device and supports it while conveying it rearwardly and upwardly,

second driving means supported on said frame for rotating said wheels so that their facing surfaces move upwardly and rearwardly, and

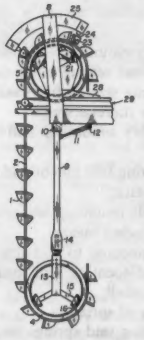
conveyor means on said frame for receiving said carton from said gripping means and moving the carton upwardly and rearwardly therefrom.

4,355,714

BUCKET ELEVATOR

Rene Chever, Paris, France, assignor to Fives-Cail Babcock, Paris, France

Filed Sep. 13, 1977, Ser. No. 832,825
Claims priority, application France, Sep. 15, 1976, 76 27649
Int. Cl.³ B65G 17/36
U.S. Cl. 198—701 **8 Claims**



1. In apparatus for transporting material, including a support, two traction members, guide means for guiding said traction members on said support in respective, spacedly parallel, closed loops, drive means for simultaneously moving said traction members in said loops, a plurality of receptacles mounted between said traction members for receiving the material to be transported, and conveying means for further moving material transported by said receptacles, the improvement in said guide means which comprises:

(a) two pairs of wheels,

(1) the wheels of each pair being mounted on said support for rotation about respective axes, one of the axes being upwardly spaced from the other axis,

(2) said traction members being trained over respective wheels of each pair, and

(3) each of said wheels of one of said pairs having an annular rim portion bounding a free space about the associated axis in a radially outward direction; and

(b) at least one roller rotatably mounted on said support in each of said free spaces in rolling, pressure transmitting and frictional contact with said rim portions and supporting said wheels on said support.

4,355,715

ROLLER CONVEYOR PERMITTING LOW PRESSURE ACCUMULATION OF ARTICLES

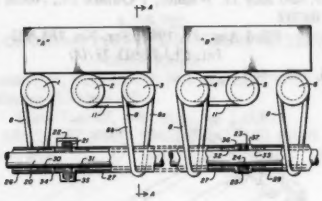
Derek C. Chorlton, Stafford, England, assignor to Conveyor Manufacturing Company, Ltd., England

Continuation of Ser. No. 966,587, Dec. 5, 1978, abandoned. This application Nov. 26, 1980, Ser. No. 210,679

Claims priority, application United Kingdom, Dec. 9, 1977, 51476/77

Int. Cl.³ B65G *13/06*

U.S. Cl. 198—781 **9 Claims**



1. In a roller conveyor including a frame, a plurality of article transporting rollers carried by said frame for free rotation therein and a drive shaft supported for rotation and extending adjacent said rollers and at an angle thereto, wherein the improvement comprises

a plurality of drive sleeves rotatably carried on the said drive shaft for frictional engagement therewith, said drive sleeves each having two end portions and a cylindrical surface extending between said end portions,

stop means located on and rotatable with said drive shaft to restrain said drive sleeves from axial movement along said shaft and to provide drive between the end portions of said sleeve and said stop means when the rollers are transporting an article, there being a running clearance between said end portions of said sleeves and said stop means when said driven rollers are not transporting an article,

a plurality of resilient drive belts looped between said sleeves and at least some of said rollers, being driven rollers, to transmit power from said drive shaft to said driven rollers, said belts acting directly on said sleeves and being free to move along the cylindrical surface of the said sleeves to take up a stable position thereon, and

each said sleeve being arranged to drive at least two said rollers.

4,355,716

CIGARETTE CASE

Alicia Berrio de la Fe, 63 Pi y Margall, Las Palmas de Gran Canaria, Spain

Filed Dec. 17, 1980, Ser. No. 217,456

Claims priority, application Spain, Dec. 17, 1979, 247.523

Int. Cl.³ B65D *77/24*; A24F *15/00, 27/00*

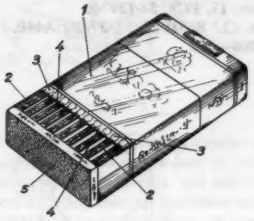
U.S. Cl. 206—90 **1 Claim**

1. A cigarette case, comprising:

a generally rectangular cigarette package having an inner lining and an outer wrapper;

a plurality of matches, each having an igniting head and a stem, said matches being arranged parallel each other and traversely spaced apart on a major side of said package;

said outer wrapper having a transverse slit, the heads of said matches being introduced into said slit and positioned



between said wrapper and said lining, each of said matches being affixed directly to said package proximate the end of said stem opposite said igniting head, with a major portion of said stem being exposed on the exterior of said package; and

an abrasive portion affixed to said package, whereby a selected one of said matches can be easily removed from said package and lighted on said abrasive portion.

4,355,717

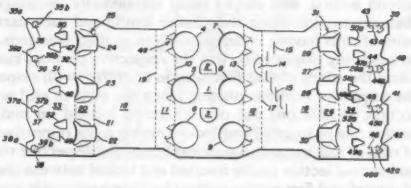
WRAPAROUND ARTICLE CARRIER WITH ADJUSTABLE GIRTH

James R. Oliff, Austell, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Jan. 7, 1982, Ser. No. 337,777

Int. Cl.³ B65D *65/00, 75/00*

U.S. Cl. 206—140 **7 Claims**

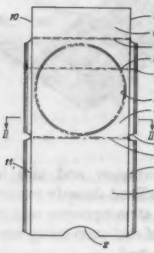


1. In an article carrier of the wraparound type formed from a blank of generally rectangular configuration and having lap panels at its ends which are overlapped and secured together in flat face contacting relation in alternate relative positions of long and short overlaps to form tubular structures of different girths respectively, an improved interlocking means comprising a combination locking and retaining tab struck from one of said lap panels, a locking tab struck from the other of said lap panels, and a retaining tab struck from the other of said lap panels and disposed in spaced transverse alignment with said locking tab, whereby said combination locking and retaining tab is driven through the aperture defined by said retaining tab when said one lap panel is disposed in an outer overlapping position relative to said other lap panel and said locking tab is driven through the aperture defined by said combination locking and retaining tab when said other lap panel is disposed in an outer overlapping position relative to said one lap panel.

4,355,718
GRAMMOPHONE RECORD SLEEVE

Gabriella Hagelberg, Stockholm, Sweden, assignor to Bengt Petersson New Products Investment AB, Askim, Sweden

PCT No. PCT/SE79/00106, § 371 Date Jan. 11, 1980, § 102(e) Date Jan. 11, 1980, PCT Pub. No. WO79/01059, PCT Pub. Date Dec. 13, 1979
PCT Filed May 10, 1979, Ser. No. 187,836
Claims priority, application Sweden, May 11, 1978, 7805372; Japan, Nov. 13, 1978, 53-139746
Int. Cl.³ B65D *85/57, 27/20;* A44B *17/00, 19/14*
U.S. Cl. 206—312 7 Claims



1. A grammophone record sleeve made of thin material, such as paper or cardboard, comprising: a first section, a second section connected to said first section along one edge thereof, said sections having such a substantially square shape and a size that they are adapted to substantially cover a record to be stored therebetween; said first section also having opposite, first edge portions perpendicular to said connecting edge; said second section having opposite, second edge portions essentially perpendicular to said connecting edge; and first and second locking means respectively provided at said first and second edge portions for connecting said sections, said locking means consisting of two stripes one running along one of said second edge portions of said first section and attached thereto and continuing along the corresponding edge portion of said second section and the other one running along the other of said second edge portion of said first section and attached thereto and continuing along the adjacent edge portion of said second section, said stripes being substantially unchanged in their crossection along their entire length and each carrying pairs of rims having widened portions at their free ends, said stripes being displaced so that the respective portions running along the edges of said first section are offset with respect to the respective portions running along the edge of said second section, so that one rim of each stripe located on said first section can be inserted and locked between the respective pair of rims of said second section and one of the respective rims of said second section can be inserted and locked between the pair of rims of said first section to thereby form a releasable connection between said sections.

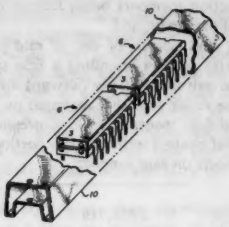
4,355,719
MECHANICAL SHOCK AND IMPACT RESISTANT CERAMIC SEMICONDUCTOR PACKAGE AND METHOD OF MAKING THE SAME

Sally K. Hinds, Santa Clara; Peter M. Weiler, Palo Alto, and Robert R. Hewitt, Sunnyvale, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Aug. 18, 1980, Ser. No. 179,146
Int. Cl.³ B65D *85/30;* H05F *3/02;* H05K *5/00, 3/00*
U.S. Cl. 206—334 9 Claims

1. In a ceramic package, adapted to hermetically house an electronic device, which is to be handled in plural numbers pursuant to testing and using wherein such handling may act to impact the devices and thereby chip said ceramic, the improvement comprising:

coating means comprising a non-conductive, heat-resistant, non-absorbent, resilient material located on said package to render it resistant to mechanical shock and impact,

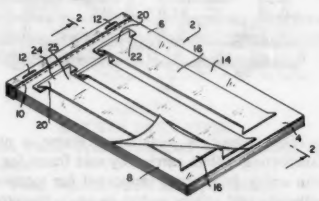


whereby the incidence of chipping is reduced or eliminated.

4,355,720
PACKAGE FOR DISPENSING PRECUT TAPE SEGMENTS

Robert Hofberg, 866 Morefield Rd., Philadelphia, Pa. 19115; Bonnie D. Goldstein, 6647 Kindred St., Philadelphia, Pa. 19149, and Roy H. Wepner, 7 Quince Pl., North Brunswick, N.J. 08902

Filed Aug. 27, 1980, Ser. No. 181,882
Int. Cl.³ B65D *73/00*
U.S. Cl. 206—460 7 Claims



1. A package for storing and dispensing precut segments of tape with adhesive backing comprising: a plurality of pieces of sheet material having first and second ends and at least an upper surface with a smooth texture adapted to releasably retain tape with adhesive backing, said pieces of sheet material being releasably bound at said first ends of said pieces of sheet material and constructed and arranged to allow removal of one of said sheets from said package, and a plurality of elongated segments of tape with adhesive backing on a first face thereof releasably mounted to said upper surface of said sheets, said tape segments including at least a first end portion having no exposed adhesive material adapted to be manually grasped for removal of said tape segments from said pieces of sheet material.

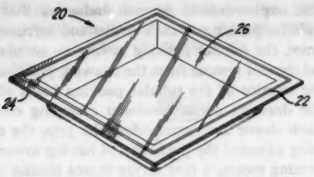
4,355,721
PACKAGE FOR FOOD PRODUCTS

Jack E. Knott, II, Menasha; Matthew S. Koschak, and John P. Adams, both of Appleton, all of Wis., assignors to American Can Company, Greenwich, Conn.

Continuation of Ser. No. 38,187, May 11, 1979, abandoned. This application Jul. 30, 1980, Ser. No. 173,748
Int. Cl.³ B65D *85/72, 65/40, 81/18;* B32B *9/04*
U.S. Cl. 206—524.2 16 Claims

1. A heat sealed package for commercial sterilization and unrefrigerated storage of food products, said package comprising multi-layer polymeric material, the layer which forms the outside surface of the package being relatively permeable to moisture at temperatures of unrefrigerated storage, the layer which forms the inside surface of the package being relatively

impermeable to moisture at the temperatures of unrefrigerated storage, being relatively permeable to moisture at temperatures of commercial sterilization, and being a heat sealable polymer



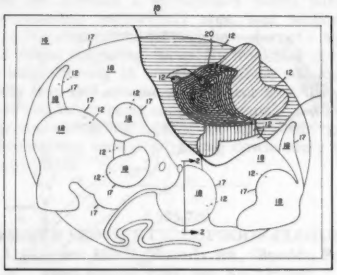
to produce a seal which will withstand commercial sterilization temperature, and an interior oxygen barrier layer consisting essentially of a vinyl alcohol polymer which is essentially free of acetal groups.

4,355,722

YARN COLORING PICTURE SET AND METHOD OF COLORING

Gary R. Lemmeyer, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Jan. 27, 1981, Ser. No. 228,871
Int. Cl.³ A01C *1/00*; B65D *69/00*; B44C *1/00*; B32B *31/00*
U.S. Cl. 206—575 **3 Claims**



1. A yarn coloring picture set comprising:

a board having a picture formed thereon, said picture comprising a plurality of colored areas, the edges of each of said colored areas closely adjoining like edges of others of said colored areas to substantially cover a major portion of said board;

a transparent adhesive layer covering a surface of said board;

a protective sheet cover releasably secured to said adhesive layer, said cover sheet having a die-cut picture imprinted thereon to form adjacent die-cut cover sheet sections, one such cover sheet section in registration with and substantially the same size and shape as each of said colored areas;

means for selectively removing said cover sheet sections to expose different parts of said adhesive layer;

a supply of different color yarns; and,

a yarn pencil for applying said yarns from a spool disposed therein; and

means for applying said different colored yarns to said exposed parts of said adhesive layer, said applied yarns adhering to said adhesive to form a yarn colored picture.

4,355,723

SHIPPING CONTAINER WITH COIL SPRING SUPPORTS

Fred M. Loeber, 1907 New Castle Ct., Arlington, Tex. 76013

Filed Apr. 29, 1980, Ser. No. 144,832
Int. Cl.³ B65D *90/16*
U.S. Cl. 206—599 **2 Claims**

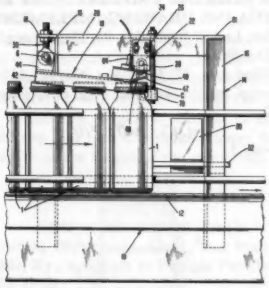
1. A shipping container, for commercial carrier use, comprising, in combination, a box, an access door on said box for loading and unloading of goods therein, and said box being collapsible; said box including thermal insulation means, padding, and shock absorbing means consisting of compression coil springs affixed to an underside of pads mounted beneath said box, each said spring including a plurality of elliptical turns, each of which is thinned at diametrically opposite longitudinal ends, so as to be more resilient at said longitudinal ends.

4,355,724

APPARATUS FOR SENSING DEPRESSIONS IN TOP PANELS OF CONTAINERS

Frank H. Erdman, Newtown Square, Pa., and William Ellis, Bradenton, Fla., assignors to Tropicana Products, Inc., Bradenton, Fla.

Filed Jun. 18, 1980, Ser. No. 160,498
Int. Cl.³ B07C *5/00*
U.S. Cl. 209—529 **19 Claims**



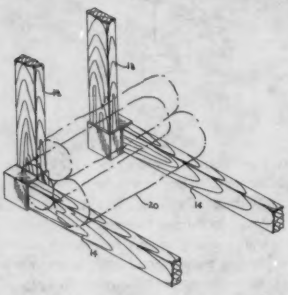
1. In apparatus for detecting whether the top panel of a container cap is properly depressed as capped containers are conveyed along a travel path, said apparatus being of the type comprising a floating shoe disposed over the travel path and carrying a sensing element, said shoe including a reference portion arranged to be contacted by the caps to conform the shoe to the orientation of the cap, the improvement wherein said floating shoe includes guide flange means movable with said reference portion and extending generally fore-to-aft and arranged to be contacted by the caps to maintain a predetermined lateral alignment between said cap and said sensing element so that said sensing element is positioned over the same place on successive caps.

4,355,725

JOINT DEVICE FOR STACKING APPARATUS

Gerald A. Humphrey, Rte. 5, Box 798, Lake Geneva, Wis. 53149

Filed Mar. 20, 1980, Ser. No. 132,128
Int. Cl.³ A47F 7/00
U.S. Cl. 211—49 R 4 Claims



1. Apparatus for stacking firewood adjacent the ground comprising:

a pair of spaced elongated horizontal members of rectangular cross-section configuration positionable adjacent the ground and on which firewood is stacked to provide stability to said members;

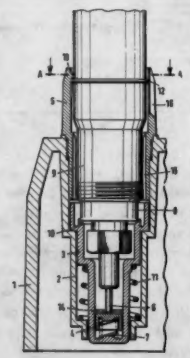
a joint device at the end of each of said spaced elongated members, said joint device consisting of a first tubular element having a rectangular cross-section receiving said horizontal member and a second tubular member secured to the side of said first tubular member and having a rectangular cross-section receiving a vertical member, said first and second elements being so joined as to present at least one flush exterior planar surface abuttable with the ground.

4,355,726

STAND FOR HOLDING AND SEALINGLY RETAINING INDIA INK DRAWING IMPLEMENTS

Otto Mutschler, Ludolf-Krehl-Str. 21, Heidelberg, Fed. Rep. of Germany (D-6900)

Filed Aug. 27, 1980, Ser. No. 181,947
Claims priority, application Fed. Rep. of Germany, Mar. 21, 1980, 3010862
Int. Cl.³ A47F 7/00
U.S. Cl. 211—69.5 8 Claims



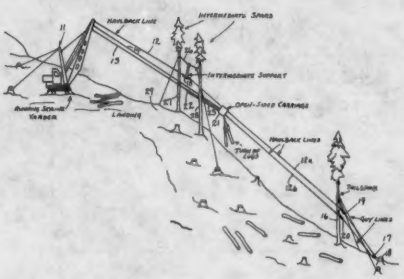
1. A stand for holding and sealingly retaining a plurality of India ink drawing implements each comprising a tubular drawing point, a grip having a front end to which the tubular drawing point is attached and an annular bead of the grip rearwardly of the front end, the stand including a like plurality of sleeves for holding the drawing implements and for sealingly retaining the implements to prevent India ink therein from drying, a tubular packing in each sleeve and surrounding the drawing point, the tubular packing having an annular sealing lip at an end thereof remote from the drawing point, a packing insert in the interior of the tubular packing has a plane face adjacent the drawing point, a tubular clamping element inserted in each sleeve and surrounding the grip, the clamping element being adjacent the packing and having inwardly projecting camming means, a first spring means biasing the packing insert to press the plane face thereof against the drawing point, and a second spring means biasing the annular sealing lip of the tubular packing into contact with the front end of the grip while engaging the annular bead of the grip with the camming means whereby the drawing implement is doubly sealed and retained.

4,355,727

INTERMEDIATE SUPPORT FOR A SKYLINE LOGGING SYSTEM

Cleveland J. Biller, Morgantown, W. Va., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jan. 25, 1980, Ser. No. 115,538
Int. Cl.³ B66C 21/00
U.S. Cl. 212—121 15 Claims



1. In a skyline cable system of the type including a load-supporting cable and a load carrying carriage having an open side and having supporting pulley means engaged on said cable, an intermediate supporting assembly comprising intermediate spar means provided with attachment means overlying an intermediate portion of said cable, suspension means supportingly engaged with said attachment means, support body means located below and substantially in vertical alignment with said suspension means, guide means on the support body means slidably and retentively receiving the load-supporting cable, elongated rail means rigidly connected to said support body means and spaced above and extending substantially parallel to said cable and being formed to engage with and elevate the carriage off of said cable as the carriage moves past said intermediate supporting assembly on said rail means, and said rail means being formed with a top surface simulating said cable, whereby the rail means serves the function of said cable and directly supports said carriage when said carriage passes said intermediate supporting assembly, and whereby said guide means causes said cable to pass smoothly over said intermediate supporting assembly.

4,355,728

SYNTHETIC RESIN THIN-WALLED BOTTLE

Akiho Ota, and Hiroaki Sugiura, both of Tokyo, Japan, assignors to Yoshino Kogyosho Co. Ltd., Tokyo, Japan

Division of Ser. No. 101,172, Dec. 7, 1979, Pat. No. 4,301,933.
This application Jan. 30, 1981, Ser. No. 229,832
Claims priority, application Japan, Jan. 26, 1979, 54-8580
Int. Cl.³ B65D *1/02*
U.S. Cl. 215—1 C 2 Claims

1. A synthetic resin thin-walled bottle having a neck portion, a biaxially oriented body wall portion extending downwardly from the neck portion and a bottom wall portion connected to the lower extremity of said body wall portion through a body wall section which extends downwardly and inwardly to said bottom wall portion, the bottom wall portion of said bottle having an upwardly projecting rise having a conical lower portion and an annular basal portion connected to said section and said rise through a substantially planar annular non ground-contacting interconnect area, said section having spaced on the circumferential periphery thereof a plurality of rounded bulges projecting outwardly from said section, each of said bulges having an underside surface positioned more outwardly than said annular interconnect area, the underside surface of said bulges being annularly arranged and forming an outer ground-contacting surface for said bottle, said outer ground-contacting surface projecting downwardly from said interconnect area.

4,355,729

SINGLE SERVICE CHILDPROOF CLOSURE

Daniel J. Maguire, 323 W. Waverly Rd., Glenside, Pa. 19038

Filed Jan. 15, 1981, Ser. No. 225,306
Int. Cl.³ B65D *55/02*
U.S. Cl. 215—215 7 Claims

1. A single service childproof container closure of the type containing a nozzle comprising

a non-removable, resilient closure which is implanted into the nozzle of the container,

said closure comprising a cylindrical sleeve member of uniform diameter, the sleeve member having a peripheral flange which is adapted to seat within a corresponding peripheral groove formed in the nozzle,

said closure comprising a non-replacable breakaway cap,

said cap being defined from the remainder of the closure by a weakened seam,

the dimensions of the closure flange being slightly greater than the dimensions of the nozzle groove whereby the closure is tightly secured within the nozzle in a non-removable manner,

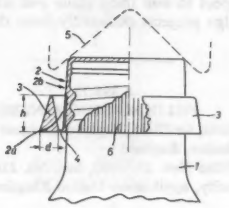
the cap comprising means to pry the cap relative to the nozzle to remove the cap from the remainder of the closure by separating the cap along the said weakened seam.

4,355,730

SCREW CAP WITH A GUARANTEE RING FOR INDICATING THE FIRST OPENING OF A CONTAINER

Walter Wiedmer, Näfels, Switzerland, assignor to Ernest Wiedmer, Näfels, Switzerland

PCT No. PCT/CH80/00066, § 371 Date Feb. 27, 1981, § 102(e) Date Feb. 27, 1981, PCT Pub. No. WO81/00550, PCT Pub. Date Mar. 5, 1981
PCT Filed Jun. 2, 1980, Ser. No. 243,926
Claims priority, application Switzerland, Aug. 17, 1979, 7563/79
Int. Cl.³ B65D *41/34*
U.S. Cl. 215—253 3 Claims



1. In combination: a screw cap for a container, and a guarantee ring for indicating the first removal of the screw cap from the container, said guarantee ring surrounding said screw cap over the circumference thereof and over part of the surface area thereof, said guarantee ring being connected at a plurality of individual points to said cap, both the inside and outside of said ring being smooth, said guarantee ring having a height which at most corresponds to half the height of said screw cap and having a thickness which is greatest at the connecting points to said cap and which decreases away from said connecting points over the height of the screw cap.

4,355,731

EGG SUPPORTING TRAY

James C. Carroll, Bartlesville, Okla., and Paul R. Lefebvre, Hopkinsville, Ky., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 16, 1981, Ser. No. 243,680
Int. Cl.³ B65D *1/36, 85/32*
U.S. Cl. 217—26.5 6 Claims

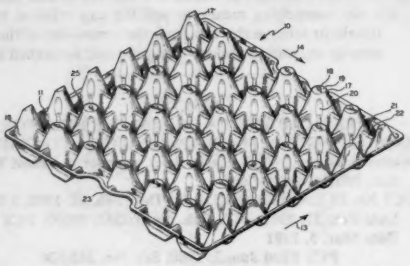
1. An egg supporting tray comprising:

a plurality of equidistantly spaced hollow posts arranged in equidistantly spaced parallel rows and equidistantly spaced parallel columns transverse to said rows, wherein the apexes of said plurality of posts are in a first plane and the bases of said plurality of posts are in a second plane and wherein a plurality of egg pockets are formed by said plurality of posts;

a concave surface, on each one of the surfaces of said plurality of posts which form a part of an egg pocket, extending from a point close to but below said first plane to a point close to but below a third plane which is parallel to the

first and second planes and which extends through a mid-portion of said plurality of posts, wherein the direction of concavity is towards the center of said posts and each concave surface has substantially the curvature of a side portion of an egg; and

an elongated ridge, on each one of the surfaces of said plurality of posts which form a part of an egg pocket, extending



from the end of said concave surface which is below said third plane to a point above the said second plane, wherein each elongated ridge is substantially perpendicular to said third plane except for any slope in the surface of said posts with respect to said third plane and wherein each elongated ridge projects outwardly from the surface of said posts.

4,355,732

FOLDING CONTAINERS

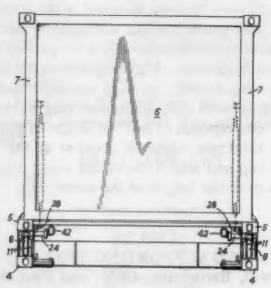
Stanley Nessfield, Driffield, England, assignor to Sea Containers Limited, London, England

Filed Nov. 25, 1980, Ser. No. 210,195

Claims priority, application United Kingdom, Nov. 27, 1979, 7940916

Int. Cl.³ B65J *1/02;* B65D *7/26*

U.S. Cl. 220—1.5 **12 Claims**



1. A folding container, comprising: a generally rectangular container base on which goods may be loaded; corner posts articulated to each corner of the base for movement between a folded-down position, in which the corner posts lie substantially flat on the base, and an erect position, in which the corner posts extend substantially vertically upwards for supporting a superimposed container or stack of containers; each corner post having a projecting heel portion formed with a first locking abutment surface thereon; said base having a second locking abutment surface thereon which confronts, and is spaced by a gap from, said first locking abutment surface when said corner post is in said erect position; said first locking abutment surface, when said corner post is swingably moved away from its erect position toward said folded-down position, being moved initially towards said second locking abutment surface along an arcuate path so as to swing clear and move past said second locking abutment surface; and lock means positionable in the gap between the first and second locking abutment surfaces and being subject to compressive forces imposed thereon for blocking movement of the corner post away from its erect position toward said folded-down position, said lock means comprising a locking member which is slidable into said gap for substantially filling said gap when the corner post is in its erect position so that the locking member blocks movement of the corner post towards its folded-down position.

4,355,733

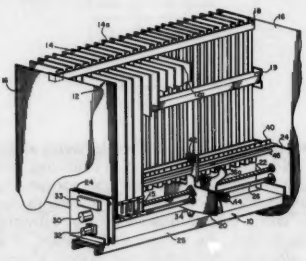
PACKAGE DISPENSER MECHANISM

Richard W. Schoenkopf, 238 E. State St., Doylestown, Pa. 18901, and Donald H. Ross, 910 Township Line Rd., Chalfont, Pa. 18914

Filed Sep. 22, 1980, Ser. No. 189,006

Int. Cl.³ G07F *11/48;* B65G *59/00*

U.S. Cl. 221—123 **11 Claims**



9. An apparatus for dispensing packages comprising:

a pair of opposed storage banks;

a plurality of package storage compartments located at predetermined positions within each of said banks;

a frame mounted between said banks;

a carriage movably mounted on said frame;

a lever rotatably connected to said carriage;

two arms, each having a portion adapted to engage a package, pivotally connected to said carriage in such manner that one of said arms independently pivots towards one of said banks upon counterclockwise rotation of said lever and the other of said arms independently pivots towards the other of said banks upon clockwise rotation of said lever;

means for moving said carriage along said frame;

means for rotating said lever in either a clockwise or counterclockwise direction;

means coupled to said carriage for producing a signal indicative of the position of said carriage with respect to said predetermined positions;

means coupled to said lever for producing a signal indicative of the direction and degree to which the lever has rotated; and

control means responsive to both said signals for causing said carriage to assume a selected one of said plurality of predetermined positions and for limiting the rotation of said lever to a predetermined degree in either direction of rotation.

4,355,734

SCRAPER AND SENSOR APPARATUS

Leo M. Moore, Rte. 4, Box 103, Ashland, Va. 23005

Filed Nov. 25, 1980, Ser. No. 210,329

Int. Cl.³ B67D *5/62*

U.S. Cl. 222—63 **22 Claims**

1. Apparatus for dispensing material from a container comprising:

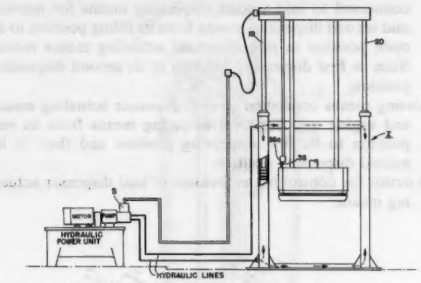
a plate having a top surface and a bottom surface and having an aperture therethrough;

means coupled with said plate for causing said material to

flow through said aperture in a direction extending from said bottom surface towards said top surface;

means coupled with said plate for causing said plate to move vertically relative to a container such that said plate may be caused to move into or out of a container as desired;

means spaced from and coupled with said plate for engagement with the inside walls of a container to scrape material from said walls as said plate moves vertically relative to a container, said space formed between said scraper means and said plate forming a cavity which communicates with said aperture and which includes a material entering opening; and,



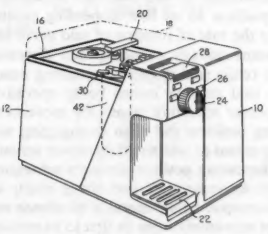
means associated with said cavity for controlling the level of said material which might enter said cavity.

4,355,735

VALVING MECHANISM FOR BEVERAGE DISPENSING DEVICE

Robert B. Whorton, III, Spartanburg, S.C., and Samuel C. Crosby, Jr., Decatur, Ga., assignors to Tannetics, Inc., Erie, Pa.

Filed Jul. 14, 1980, Ser. No. 168,053
Int. Cl.³ B67D *1/04, 5/54*
U.S. Cl. 222—80 **2 Claims**



1. A beverage dispensing device for dispensing carbonated drinks that are mixed from a solution of carbonated water and syrup, said device including a disposable syrup package, a source of carbonated water, a mixing head connected to said source of carbonated water and to said syrup package for mixing a measured amount of said carbonated water with said syrup producing a carbonated drink, said syrup package being carried in a receptacle, the improvement comprising:

a source of pressurized gas;

a piercing device impaling said syrup package and connecting said pressurized gas to the interior of said syrup package;

valve means interposed between said source of pressurized gas and said piercing device;

valve actuator means causing said valve to provide communication between said source of pressurized gas and said syrup package when in a first position and venting said syrup package back through said valve when in a second position;

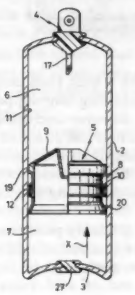
said valve actuator means extending over a top of said package obstructing the removal of said piercing device from said syrup package and removal of said syrup package from said receptacle when in said first position for ensuring that said syrup package is vented back through said valve prior to removal of said piercing device from said package and prior to removal of said package from said receptacle in order to prevent syrup from being expelled from said package upon being removed from said piercing device.

4,355,736

DEVICE FOR DISPENSING A LIQUID OR A PASTE IN A FINELY DIVIDED MANNER

Henri J. J. Schumacker, and Terese F. Schumacker, both of 121A Ave. Van Becelaere, B-1170 Brussels, Belgium

Continuation of Ser. No. 11,583, Feb. 12, 1979, abandoned. This application Mar. 3, 1981, Ser. No. 239,925
Claims priority, application Belgium, Mar. 1, 1978, 185581
Int. Cl.³ B67D *5/54*
U.S. Cl. 222—80 **2 Claims**



1. A device for dispensing a liquid or a paste in a finely divided form, comprising: a substantially tubular closed rigid container (2), valve means (4) mounted in one end of the container for ejecting liquid or paste therein through an outlet tube (17) connected to the valve means, the container having two superimposed chambers separated from each other by a piston (5) adapted to slide along the inner wall (11) of the container when the valve means is operated, a lower one (7) of said chambers containing a gas under pressure and an upper one (6) of said chambers containing a liquid or paste to be dispensed, the piston having the shape of an inverted deep cup open toward the gas containing chamber, and having a rigid bottom (9) facing the valve means and a flexible cylindrical thin side wall (8), a rigid annular scraper flange (19) integral with said side wall and extending from the peripheral edge of said bottom toward the free end of and around said side wall to render said side wall stiff around its portion connected to said bottom for removing bulges or dents in the inner wall of the container, a truncated guide cone (20) flaring outwardly toward said inner wall at the free end of the side wall, at least one intermediate, outwardly extending sealing projection (10) carried by said side wall in the space between said scraper flange and said truncated guide cone, said piston side wall being spaced from the container inner wall and contacting same only through the scraper flange, the sealing projection and the truncated guide cone, the rigid bottom of the piston having an upper surface directed toward the liquid or paste containing chamber and having the shape of a truncated cone (14) flaring outwardly toward the inner wall of the container, a central cavity (16) defined in the bottom of the piston and open towards the liquid or paste containing chamber, and a membrane (15) embodied in

the bottom of said cavity adapted to be pierced by the outlet tube when the piston has reached an upper limit of its travel in the container to vent any pressurized gas remaining in said lower chamber.

4,355,737

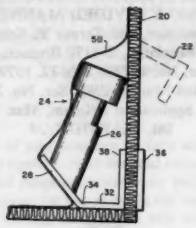
FLUID DISPENSER

Robert G. Pongrass, #2A Bulkara Rd., Bellevue Hill, New South Wales, Australia, and Christopher C. Rutter, 24174 Dover La., Hayward, Calif.

Filed Jan. 16, 1981, Ser. No. 225,788

Int. Cl.³ B67B *7/24*

U.S. Cl. 222—81 9 Claims



1. In combination with a bulk fluid container comprising a flexible sealed fluid containing bag supported within a rigid outer container, a fluid dispenser including:

a tubular sleeve having a first end attached to the fluid containing bag at an oblique angle and a second end extendable from the outer surface of the rigid outer container, said second end having a first fluid dispensing aperture in the lower wall of said sleeve; and

a tubular valve member rotatably positioned within the bore of said tubular sleeve, the first end of said valve member being formed at an oblique angle and having a sharpened end portion, the second end of said valve member having a second fluid dispensing aperture in the wall and handle means for rotating said valve member within said sleeve between a first "off" position and a second "on" position;

in said first "off" position, said sharpened end portion of said valve member extending within said sleeve to, but not touching said fluid containing bag and said first and second fluid dispensing apertures being non-aligned; and in said second "on" position said sharpened end entering said fluid containing bag and said first and second fluid dispensing apertures being substantially aligned.

4,355,738

TREATY AGENT DISPENSING APPARATUS FOR A WASHING APPLIANCE

Le Roy J. Herbst, and John L. Preher, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Dec. 26, 1979, Ser. No. 107,217

Int. Cl.³ B67D *5/08*

U.S. Cl. 222—129 10 Claims

1. Dispensing apparatus for sequentially dispensing treating agents into the wash chamber of an automatic washing appliance comprising:

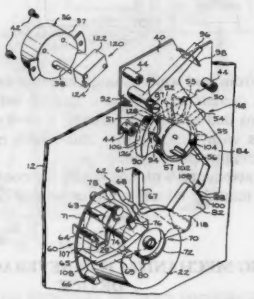
first dispensing means to store and dispense a first treating agent; said first dispensing means including a dispensing member adapted to move between a closed position storing the first treating agent and an open position enabling dispensing of the first treating agent;

second dispensing means to store and dispense a second treating agent; said second dispensing means being adapted to move between a filling position storing the second treating agent and an open position dispensing the second treating agent;

dispenser actuating means adapted for movement between a rest position, a first dispensing position and a second dispensing position; said dispensing actuating means being connected to said dispensing member of said first dispensing means for moving said dispensing member from its closed position to its open position as said dispenser actuating means moves from its rest position to its first dispensing position and said dispenser actuating means being connected to said second dispensing means for moving said second dispensing means from its filling position to its open position as said dispenser actuating means moves from its first dispensing position to its second dispensing position;

biasing means connected to said dispenser actuating means and urging said dispenser actuating means from its rest position to its first dispensing position and then to its second dispensing position;

a motor for controlling movement of said dispenser actuating means;



a drive shaft adapted for rotation by said motor;

linking means mechanically interconnecting said dispenser actuating means to said drive shaft for controlling the movement of said dispenser actuating means so that the rate of movement of said dispenser actuating means from its rest position to its first dispensing position is determined by the rate of rotation of said drive shaft;

retainer means initially engaging said dispenser actuating means to retain said dispenser actuating means in its rest position, said retainer means being operative to release said dispenser actuating means for movement to its first dispensing position and then re-engaging said dispenser actuating means to retain said dispenser actuating means in its first dispensing position during a subsequent period of rotational movement of said drive shaft; said retainer means thereupon being operable to release said dispenser means for movement from its first to its second dispensing position.

4,355,739

LIQUID STORAGE CONTAINER

Peter Vierkötter, Leverkusen, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

Filed Sep. 22, 1980, Ser. No. 189,605

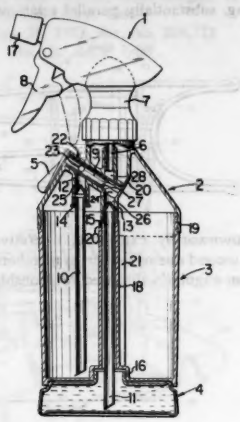
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1979, 2940564

Int. Cl.³ B67D *5/52*

U.S. Cl. 222—134 5 Claims

1. A liquid storage container that can be connected or attached to a spray pump means which comprises two separate chambers to hold liquid components, each chamber having a one-way valved suction take-up tube which leads to a mixing chamber contained within a movable member attached to a movable external selector means, the member having openings therein, wherein, when the external selector means is moved,

the movable member attached thereto moves in a manner such that the ratio of the quantities of liquid components sucked



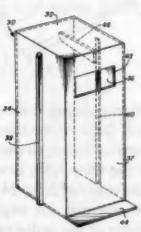
from the chambers varies, said mixing chamber being adapted to be connected or attached to a spray pump means.

4,355,740

CONTAINER HOLDER AND ACTUATOR FOR AEROSOL CANS

David Wolf, Newton, Mass., assignor to Scott's Liquid Gold, Inc., Denver, Colo.

Filed Oct. 6, 1980, Ser. No. 194,375
Int. Cl.³ B65D *83/14*
U.S. Cl. 222—180 4 Claims



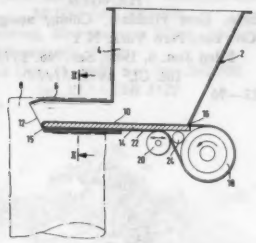
1. A holder apparatus for retaining and engaging pressurized cans, said pressurized cans having a valve and nozzle located on the can, said holder apparatus adapted to be wall-mountable and comprising a holder body adapted to hold a pressurized can, a removable cover, extension means within the cover for engaging the valve of the pressurized can when said cover moves downward relative to said holder body, and means for slideably mounting the cover over the holder body, including at least one longitudinally extending rail and a longitudinally extending groove for receiving said rail with one of said rail and groove on the inside surface of said cover and the other on the outside surface of said holder body, so that when the cover is placed onto the holder body, the rail engages said groove to produce a slideable fit between the cover and the holder body.

4,355,741

SACK-FILLING MACHINE

Manfred Kayss, Hubertusstr. 30, 3320 Salzgitter 51, Fed. Rep. of Germany

Filed Mar. 24, 1980, Ser. No. 132,985
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1979, 2912604
Int. Cl.³ G01F *11/20*; B65B *1/04*
U.S. Cl. 222—415 17 Claims



1. A sack filling machine comprising:

a. a filling tube having a downstream end which is receivable in a sack, said tube including at least one wall;

b. a guide plate which extends a distance through said tube along the inner surface of said wall from a point upstream of the downstream end of said tube to a point adjacent said downstream end, said guide plate terminating in a rounded downstream edge; and

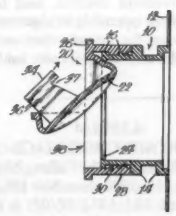
c. a conveyor belt which extends along said plate in said tube to a point adjacent the downstream end of said tube and around said rounded edge, whereby when the downstream end of said tube is received in said sack said conveyor belt also extends a distance into said sack so that upon activation of said conveyor belt it is operable to transport material thereon through said tube to the downstream end thereof and into said sack.

4,355,742

DISPENSER SPIGOT FOR VISCOUS MATERIAL

William R. Scholle, Corona del Mar, Calif., assignor to Scholle Corporation, Northlake, Ill.

Filed Feb. 5, 1979, Ser. No. 9,544
Int. Cl.³ B65D *25/48*
U.S. Cl. 222—490 10 Claims



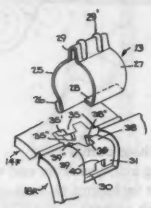
1. A dispensing spigot for a container having a spout, comprising an integral elastomeric member having transverse wall means adapted to be inserted into the spout in sealing engagement therewith, a flange at an outer end of said transverse wall means extending generally laterally therefrom, said flange having an elongate slit therein laterally outwardly of said transverse wall means extending over a major portion of the marginal extent of said flange, and manipulatable means on said transverse wall means for flexing the portions of said transverse wall means inwardly of said slit generally radially in-

wardly away from the spout and for flexing the portions of said flange inwardly of said slit both radially inwardly and generally longitudinally outwardly away from the spout to open up said portions of said transverse wall means and said flange and provide a large mouth dispensing opening through the flexed portions of said transverse wall means and said flange.

4,355,743
HEAVY AND LIGHT DUTY GARMENT CLAMPING HANGER

Marc Erthein, East Haddam, Conn., assignor to National Hanger Co., Inc., New York, N.Y.

Filed Jun. 6, 1980, Ser. No. 157,075
Int. Cl.³ A47D 51/14
U.S. Cl. 223—96 **11 Claims**



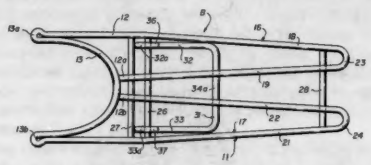
1. A garment hanger clamp comprising rear and front gripping members hinged at the top walls to form relatively stationary and movable parts respectively for movement between a closed and locked article gripping position and an open and unlocked article releasing position, a springable locking clip operable on the outer faces of said gripping members and intermediate the width thereof and adapted to have at least an initial position when the gripping members are open and a final position when the gripping members are closed and in article gripping position, pivotal anchoring means for the clip and between the rear end of said clip and the rear gripping member intermediate the height thereof and including stop means for rearwardly limited rotary movement of said clip, and whereby said clip in said initial position has the front end thereof releasably tensioned against the top wall of said rear gripping member, said clip in said initial position projecting behind and substantially below the top of the rear gripping member, said clip in said final position overlying the top walls and engaging at least portions of the outer faces of the gripping members, said clip attaining said final from initial position by forward rotary movement thereof and attaining initial from final position by rearward movement thereof, said top walls of the gripping members having openable bridge means for creating an opening therebetween for introduction and withdrawal of the said front end of the clip to effectuate said pivotal anchoring of the clip.

4,355,744
PORTABLE BOOTJACK

Robert A. Dudley, 385 Reagan Pl., Fallon, Nev. 89406

Filed Oct. 14, 1980, Ser. No. 196,340
Int. Cl.³ A47J 51/02
U.S. Cl. 223—114 **8 Claims**

1. A portable bootjack comprising, in combination, a substantially planar body forward from a metal rod having free ends, said rod having a formed portion adjacent said free ends defining a forwardly opening, U-shaped configured yoke for receiving a boot heel and having longitudinally extending portions rearwardly said yoke and about and beyond said free ends disposed in side-by-side relationship and terminating with said free ends fixed to a bight portion of said yoke defining a platform for pressing engagement by the foot of a user, a plurality of longitudinally spaced, transversely extending cross members formed from a metal rod secured to said longitudinally extending rod portions, and a leg member formed from a metal rod pivotally mounted on a first one of said cross members for movement between an inoperative folded position in underlying, substantially parallel relationship with said body

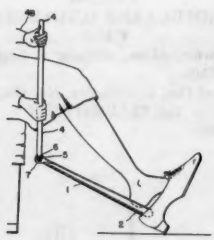


and a downwardly extending, operative position abutting against a second one of said cross members for supporting said body in an angularly disposed relationship with a supporting surface.

4,355,745
SHOE HORN FOR HANDICAPPED PERSONS

Marie A. Nelson, 600 E. 8 St. #416, Kansas City, Mo. 64106

Filed Jul. 25, 1980, Ser. No. 172,272
Int. Cl.³ A47J 51/02
U.S. Cl. 223—118 **1 Claim**



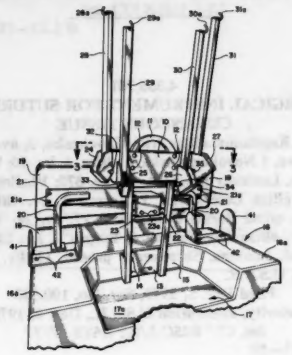
1. A method of manipulating a shoe horn device so as to enable a person, with little or no bending movement of the body at the waist, hips or knees, to put on (laced up or elastic top) shoes, wherein the shoe horn device comprises an elongated shoe horn of the order of 20 to 24 inches in length having a curved portion at one end for engaging the heel and an elongated handle device of the order of 20–25 inches in length pivoted at one end to the other end of the shoe horn, said method consisting of the following steps (1) slipping the foot into the shoe as far as it will go while the person is in a seated position (2) gripping the handle and holding it and the shoe horn in a vertical position (3) manipulating the handle so that the end of the shoe horn enters the shoe with the concave portion contacting the foot on the inner side of the foot, (4) letting the gripped handle slide downwardly to thereby cause the shoe horn to attain substantially a horizontal position while at the same time slightly moving the handle laterally to maneuver the shoe horn to bring its curved end toward and under the heel while the shoe horn end is still partially in the shoe (5) with the shoe horn end under the heel lifting the handle upwardly thus forcing the heel (and the foot) completely into the shoe and (6) withdrawing the shoe horn from the shoe.

4,355,746

GOLF BAG HOLDER FOR USE WITH GOLF CARS

Dale D. Casady, Salt Lake County, Utah, assignor to Bailey & Sons Company, Salt Lake City, Utah

Filed Aug. 20, 1981, Ser. No. 294,721
Int. Cl.³ A47F 7/00
U.S. Cl. 224—274 6 Claims



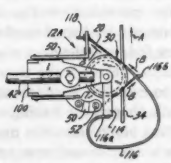
1. A golf bag holder for use with golf cars, comprising a frame; a plurality of arms pivotally mounted to said frame; means for attaching a golf bag to each arm so that the end of the bag from which the clubs extend is supported by an arm while the other end of the bag rests on the car; stop means to stop travel of each arm about its pivot in one direction at the preferred point for supporting the golf bag and in the other direction at a point at which the arm can rest out of the way in an unused positon; means to hold an arm in its unused positon when not holding a golf bag; and means for securing said frame to a golf car.

4,355,747

MULTI-PURPOSE YARN FEEDING DEVICE

Juan Vinas, Middle Village, N.Y., assignor to Textile Technology, Inc., White Plains, N.Y.

Filed May 12, 1980, Ser. No. 97,735
Int. Cl.³ B65H 23/16
U.S. Cl. 226—34 18 Claims



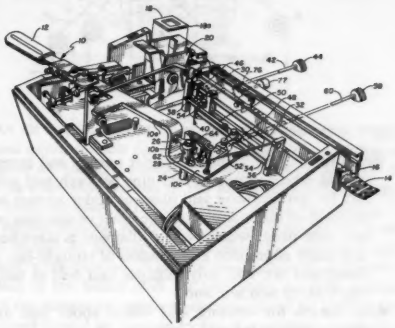
1. In a device for feeding of yarn to a yarn processing machine such as a knitting machine, at least one rotary member mounted for rotation at a feeding station of the knitting machine, said rotary member being provided about the circumferential periphery thereof with yarn gripping means for frictionally engaging yarn during contact therewith; first guide means for guiding at least one yarn to the feeding station and guiding the incoming yarn to said circumferential periphery of said rotary member; second guide means for guiding the outgoing yarn from said circumferential periphery and to the needles of the knitting machine, said first and second guide means being selectively arranged to cause the yarn to be in contact with a predetermined arcuate length of said circumferential periphery of said rotary member; drive means for rotating said rotary member; and dynamic adjustment means engaging the yarn between said first and second guide means for modifying the arcuate length of contact with said circumferential periphery as a function of the input and output tensions in the yarn, whereby the traction or frictional forces imparted to the yarn are modified as a function of the tensions in the yarn to thereby compensate for variations therein.

4,355,748

FILM ADVANCE BREAKAWAY MECHANISM FOR SLIDE MOUNTER

Armer J. Willenbring, Bloomington, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Filed Oct. 31, 1980, Ser. No. 202,600
Int. Cl.³ G03B 1/22
U.S. Cl. 226—67 7 Claims



1. A film advance mechanism for advancing a photographic film web along a film track, the film advance mechanism comprising:

a guide track essentially parallel to the film track;

carriage means movable on the guide track between a first and a second end;

drive means for advancing the carriage means toward the first end during a portion of an operating cycle of the film advance mechanism and returning the carriage means toward the second end during another portion of the operating cycle;

film advance pawl means connected to and movable with the carriage means for engaging sprocket holes of the film web to advance the web as the carriage means advances; and

means for disconnecting the carriage means and the drive means when resistance to advancement of the carriage means toward the first end exceeds a predetermined amount.

4,355,749

FEEDING APPARATUS FOR WET YARN

Karl-Heinz Wülfing, and Werner Engelhardt, both of Wuppertal, Fed. Rep. of Germany, assignors to Hacoba Textilmaschinen GmbH & Co. KG, Wuppertal, Fed. Rep. of Germany

Filed Oct. 1, 1980, Ser. No. 192,822
Claims priority, application Fed. Rep. of Germany, Oct. 2, 1979, 2939873
Int. Cl.³ B65H 51/00, 51/14
U.S. Cl. 226—171 10 Claims

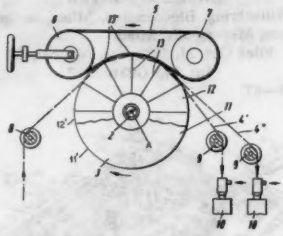
1. A filament-feeding apparatus comprising:

a feed wheel centered on and rotatable about an axis and having a pair of side parts having generally circular peripheries lying in parallel spaced-apart planes perpendicular to said axis and a plurality of angularly spaced center parts axially bridging said side parts and having outer edges axially aligned with said peripheries, said wheel

being open and free of structure in zones radially inward of said peripheries and radially outward of secants extending between said outer edges;

a flexible endless belt having a width equal at least to the axial spacing between said peripheries;

guide means including a plurality of pulleys carrying said belt for holding a portion of said belt in a circular arc radially against said peripheries, whereby said belt forms nips at the ends of said circular arc;



means for feeding a filament under tension and tangentially of said wheel to one of said nips between said side parts and for withdrawing said filament under tension and tangentially of said wheel from the other of said nips between said side parts, whereby said filament is stretched over said outer edges into a succession of straight-line secants along said arc and only engages said belt at said outer edges along said arc; and

drive means for rotating said wheel about said axis and thereby advancing said filament.

4,355,750

DOUBLE-CAPSTAN TAPE DRIVING DEVICE

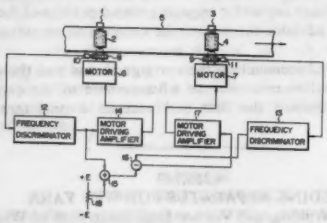
Sinichi Saitou, Hachioji; Toshikazu Kato, Hino; Kenji Kimura, Tachikawa; Ken Satoh, Akigawa; Tsutomu Shibata, Hachioji; Seizo Watanabe, Hachioji, and Ken Ohshima, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 21, 1980, Ser. No. 199,325

Claims priority, application Japan, Oct. 26, 1979, 54-148560[U]

Int. Cl.³ B65H *17/22*

U.S. Cl. 226—188 **8 Claims**



1. A double-capstan tape driving device having first and second capstans adapted to be in driving contact with the tape, comprising:

first and second servo loops coupled to the first and second capstans, respectively, for rotating said first and second capstans at respective speeds independently of each other; and

revolution speed control means coupled to at least one of said first and second servo loops for selectively supplying an offset voltage, which is generated externally of said first and second servo loops, to at least one of said first and second servo loops to selectively change a revolution speed of one of said first and second capstans independently of the revolution speed of the other of said first and second capstans to thereby selectively change the tension applied to the tape between the first and second capstans when said first and second capstans are in driving contact with the tape.

4,355,751

SURGICAL INSTRUMENT FOR SUTURING CUTANEOUS TISSUE

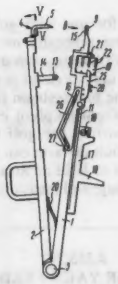
Nikolai N. Kapitanov, ulitsa Iriny Levchenko, 3, kv. 9; Natalya P. Petrova, 1 Novokuzminskaya ulitsa, 4, kv. 40; Vsevolod V. Judenich, Leninsky prospekt, 87, kv. 370; Vladimir P. Kharchenko, ulitsa Lesevskaya, 1, korpus 4, kv. 761; Boris A. Smirnov, ulitsa Borisa Galushkina, 17, kv. 26; Vladimir V. Ippolitov, ulitsa Lavochkina, 6, korpus 2, kv. 143, and Nadezhda M. Lankina, Shenkursky proezd, 12, kv. 123, all of, Moscow, U.S.S.R.

Filed Dec. 5, 1979, Ser. No. 100,543

Claims priority, application U.S.S.R., Dec. 8, 1978, 2719347

Int. Cl.³ B25C *5/02*; A61B *17/32*

U.S. Cl. 227—19 **2 Claims**



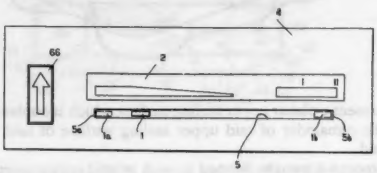
1. A surgical instrument for suturing cutaneous tissue using U-shaped staples, comprising a supporting body and a staple body, said bodies being pivotally connected so as to be movable together during suturing and movable apart after suturing, a replaceable magazine provided on the staple body and adapted to accommodate said U-shaped staples, a stitching unit to which said staples are fed from the magazine, said unit being adapted to pass the staples through the tissues being sutured and bend said staples to establish a suture, said stitching unit including a single needle-shaped die having an L-shaped needle fixed to the supporting body, and a slot provided at the end of the staple body which is positioned so as to be receivable of the needle of said needle-shaped die when said supporting and staple bodies are move together so that the needle of said needle-shaped die passes therethrough, said staple body having a longitudinal groove formed therein which communicates through one of its ends with the base of said slot in the stitching unit, and which communicates through its other end with a staple receiving opening formed in the magazine, a groove provided in the supporting body arranged such that, when said bodies are moved together, said groove communicates with said staple receiving opening formed in the magazine, said needle-shaped die having two recesses, one of said recesses communicating with said groove formed in the supporting body, while the other recess is arranged such that when the needle of said needle-shaped die enters said slot, said recess enters into communication with the groove formed in the staple body, and an ejector for driving the staples out of the magazine.

4,355,752

CONTROL DEVICE AND METHOD FOR AN AIR CONDITIONING INSTALLATION OF THE PASSENGER SPACE IN A MOTOR VEHICLE

Jacquet M. Antoine, Maurepas, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed Jan. 18, 1980, Ser. No. 113,226
Claims priority, application France, Jan. 22, 1979, 79 01539
Int. Cl.³ B60H 1/02
U.S. Cl. 237—12.3 B 6 Claims



1. A single knob control device for air conditioning the passenger space of a motor vehicle comprising:

an actuating member mounted for one dimensional displacement in a control panel;

means for controlling the operation of a variable speed fan including the speed thereof for blowing air into the passenger space;

means for controlling the heating of air admitted into said passenger space;

means for selectively controlling the distribution of air admitted into said passenger space, including admission through at least one vent adjacent a windshield of the motor vehicle;

means for transmitting motion of said actuating member to said first, second and third controlling means, as said member is displaced, wherein said first, second and third control means and the motion transmitting means are arranged relative to one another for:

in a first position of said actuating member, blowing air at maximum temperature through said windshield vent by operating said fan at maximum speed;

as said actuating member is moved away from said first position, decreasing the temperature of the air admitted to said passenger space, and decreasing the operating speed of said fan;

in a second position of said actuating member admitting non-heated air blown by the fan operating at maximum speed through said windshield vent, and

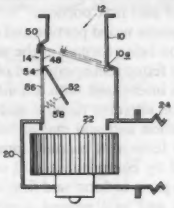
as said actuating member is moved away from said second position, decreasing the operating speed of said fan, said motion transmitting means and said first, second and third controlling means also have a neutral position intermediate said first and second positions along a one dimensional path of displacement of said actuating member between said first and second positions so that said movements away from said first and second positions are towards said intermediate position, said fan and heating controlling means being in an "off" condition in said intermediate position, and said air distribution controlling means comprising a rotary fluid pressure distributor operatively connected for rotation about an axis in response to said motion transmitting means, said distributor having a plurality of fluid pressure outputs connected to respective pressure controlled flaps for selectively controlling the distribution of air into said passenger compartment.

4,355,753

AIR HEATING SYSTEM OF INTERNAL COMBUSTION ENGINE-MOUNTED MOTOR VEHICLE

Takeaki Watanabe, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed May 20, 1980, Ser. No. 151,544
Claims priority, application Japan, May 31, 1979, 54-72446
Int. Cl.³ B60H 1/02
U.S. Cl. 237—12.3 A 11 Claims



1. An air heating system of an internal combustion engine-mounted motor vehicle for heating a passenger compartment, having an air passage means extending from an outdoor air intake to a selected portion of the passenger compartment; a heater core disposed in the air passage means for heating, by using engine cooling water as a heating medium, air which travels in said air passage means toward the passenger compartment; a fan disposed in said air passage means at a position upstream of the heater core for producing air flow directed toward the passenger compartment; an indoor air intake opening formed in said air passage means at a position upstream of said fan, said opening being open to said passenger compartment; and a damper door pivotally mounted in said air passage means and having first and second rest positions, said first position being a position to close said outdoor air intake while opening said indoor air intake opening, said second position being a position to close said indoor air intake opening while opening said outdoor air intake, wherein said damper door is formed with an opening and wherein an auxiliary door is pivotally connected to said damper door to selectively close and open said opening in the damper door, the connection of said auxiliary door to said damper door being such that when said damper door takes said second rest position and the pressure in the air passage means at the portion upstream of said fan is lower than that in the passenger compartment, said auxiliary door is forced to open to a certain extent permitting introduction of passenger compartment air into the air passage means through said opening in the damper door.

4,355,754

STRUCTURAL MEMBERS COMPRISED OF COMPOSITE WOOD MATERIAL AND HAVING ZONES OF DIVERSE DENSITY

Anders E. Lund, Houghton, and Gordon P. Krueger, Hancock, both of Mich., assignors to Board of Control of Michigan Technological University, Houghton, Mich.

Filed May 18, 1981, Ser. No. 264,222
Int. Cl.³ E01B 21/04; B32B 9/04
U.S. Cl. 238—83 35 Claims

1. An elongated composite wood member having a longitudinal axis and being comprised of composite wood material, said composite wood material member comprising:

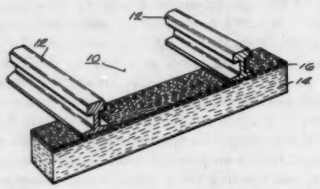
a first composite wood material portion including elongated planar wood flakes intermixed with a binder and compressed to form a densified product, said elongated wood flakes each having a longitudinal axis, the grain direction of said wood flakes being aligned parallel with said longitudinal axis of said wood flakes, said wood flakes being aligned with their longitudinal axis parallel to the longitu-

dinal axis of the elongated member, and said planar wood flakes lying in parallel planes, and

a second composite wood material portion integrally joined to said first composite wood portion, said second composite wood material portion comprising elongated planar wood flakes intermixed with a binder and compressed to form a densified product, said densified product formed by said second composite wood material portion having a density other than the density of said first portion and having strength properties different from the strength properties of said first portion,

said first composite wood portion and said second composite wood portion being formed at the same time and by forming a loosely felted mat comprised of said elongated planar wood flakes intermixed with a binder, said mat including a first portion intended to form said first composite wood material portion and said mat including a second portion intended to form said second composite wood material portion, and by compressing said composite wood material mat in a press to form said first composite wood material portion and said second composite wood material portion.

27. A method for forming an elongated solid structural



member including a first structural member portion having a first density and a second structural member portion integrally joined to the first structural member portion and wherein the second structural member portion has a density greater than that of the first structural member portion, the method comprising the steps of

providing elongated wood flakes having a grain direction extending generally parallel to the longitudinal axis thereof,

admixing a binder with the wood flakes,

forming a first mat of the resulting mixture with at least a majority of the wood flakes oriented such that the longitudinal axis thereof is parallel to the axis of the structural member to be formed from the mat,

forming a second mat portion by depositing additional quantities of said resulting mixture on at least portions of said first mat with at least a majority of the wood flakes in said additional quantity being oriented such that the longitudinal axis thereof is parallel to the axis of the structural member to be formed, and

compressing said first and second mat portions in a press applying sufficient pressure on the mat to bond the wood flakes together to form a densified integral compressed product.

4,355,755

FOOD TRAY

Rudolph A. Faller, Edina, Minn., assignor to Champion International Corporation, Stamford, Conn.

Filed Sep. 2, 1980, Ser. No. 182,855

Int. Cl.³ B65D *1/34, 1/46*

U.S. Cl. 229—2.5 R **8 Claims**

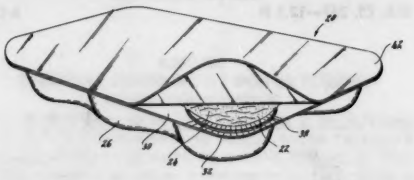
1. A one-piece deep drawn paperboard food tray comprising:

(a) a bottom wall;

(b) means forming a side wall integral with said bottom wall and extending upwardly therefrom to form sides for said tray surrounding said bottom wall;

(c) a flange integral with said side wall and extending outwardly from a top edge of said side wall to form an upper planar sealing surface about the upper periphery of said tray;

(d) said flange including corner portions having a plurality of pleats formed therein, said pleats being flattened so as to



present a planar upper sealing surface which is coplanar with the remainder of said upper sealing surface of said flange; and

(e) recessed troughs formed in each of said corner portions of said flange, said troughs traversing said pleats with both sides of said troughs being bounded by said planar upper sealing surface formed by said flattened pleats.

4,355,756

CONTAINERS ADAPTED TO CONTAIN FOODSTUFFS

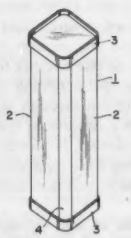
Hiroshi Furuya, Kawasaki; Munehisa Okada, Machida; Eiichiro Takemura, Tokorozawa, and Hideyo Sato, Yokohama, all of Japan, assignors to Mitsubishi Kasei Kogyo Kabushiki Kaisha and Zenkoku Nogyo Kyodo Kumiai Rengo Kai, both of Tokyo, Japan

Filed Oct. 17, 1980, Ser. No. 198,214

Claims priority, application Japan, Oct. 25, 1979, 54-137984; Nov. 6, 1979, 54-143602

Int. Cl.³ B65D *3/12, 3/28*

U.S. Cl. 229—4.5 **6 Claims**



1. A foodstuff container comprising a cylindrical body and lids closing opposite ends of said cylindrical body, said cylindrical body being formed with a laminated sheet made up of two outer layers made of a thermoplastic resin consisting essentially of a synthetic resin having a melting point of higher than 115° C., a paper layer and an aluminum foil, each lid being made up of an aluminum foil coated with a thermoplastic resin similar to that of said laminated sheet, opposite side edges of said laminated sheet being covered by separate tape shaped aluminum foils with both surfaces coated with a thermoplastic resin similar to that of said laminated sheet, one side of each said tape shaped aluminum foils being bent back upon itself so that its outer surface is in face to face contact with the inner surface of said container, said tape shaped aluminum foils and said opposite side edges of said laminated sheet being welded together such that said aluminum foils are disposed in a non-superimposed contiguous relation so that the unbent side of one tape faces the fold or bent portion of the other tape,

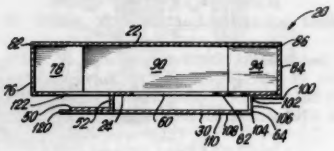
thereby avoiding impractical thickness of the weld to form said cylindrical body.

4,355,757

VENTING CARTON AND BLANK THEREFOR

Harry I. Roccaforte, Western Springs, Ill., assignor to Champion International Corporation, Stamford, Conn.

Filed Mar. 5, 1981, Ser. No. 240,924
Int. Cl.³ B65D 5/22, 5/35, 5/36
U.S. Cl. 229—33 12 Claims



1. A carton adapted for storing and heating a food product such as a pizza, said carton comprising:

opposed top and bottom walls disposed in spaced apart, parallel relationship; and

a tubular side wall extending between and hingedly connected to the side edges of said top and bottom walls to define an enclosed carton, said bottom wall being defined by a bottom panel and closure panel disposed in abutting relationship to said bottom panel and, said closure panel being located externally of said carton, said bottom panel including a rectangular vent panel disposed adjacent to and spaced from one side edge of said bottom panel and defined by a combination of a first fold line and an intermittent U-shaped cut line, said U-shaped cut line extending away from said one side edge, said rectangular vent panel including a second fold line disposed parallel to said first fold line and dividing said vent panel into a support panel and a first elevator panel, said bottom panel further including at least one venting aperture formed in the remaining area of said bottom panel and with said support panel of said bottom panel being adhesively connected to said closure panel adjacent one side edge thereof, and with said bottom panel being further adhesively connected to said closure panel along a line adjacent the other side edge of each of said panels respectively, and with said closure panel further including a pair of fold lines disposed parallel to and spaced from said other side edge of said closure panel and defining a second elevator panel whereby when said food product is to be heated within said carton, said intermittent score line defining a portion of said venting panel is broken such that said closure panel may be rotated downwardly away from, and laterally to said bottom panel, with said elevator panels extending therebetween thereby uncovering said one venting aperture and defining a base for supporting said bottom panel in spaced relationship therewith, and with said vent panel being rotated out of the plane of said bottom panel to define another venting aperture.

4,355,758

CARTON WITH WINDOW AND HANGING PANEL AND CARTON BLANK THEREFOR

John J. Lavery, Chicago, Ill., assignor to Champion International Corporation, Stamford, Conn.

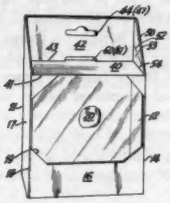
Filed Mar. 9, 1981, Ser. No. 242,016
Int. Cl.³ B65D 5/10, 25/22
U.S. Cl. 229—39 R 4 Claims

1. A paperboard windowed carton formed from a one-piece carton blank comprising:

a plurality of central panels joined along articulated fold lines and including a front panel, its opposite back panel having an opening therein for hanging the carton and having an upper portion thereof extending in height beyond the height of said front panel, and two opposite side panels, said front panel having a window therein adapted to show the front of the carton's contents;

a plurality of bottom panels joined to at least some of said center panels to form a bottom closure for the carton;

a plurality of top panels to form a top closure and a hanging panel, said top panels comprising a rectangular top flap articulatedly connected to said front panel and perpendicular thereto, a hanging panel articulatedly connected to



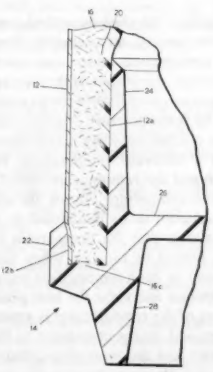
said top flap and perpendicular thereto so that it lies flat against said upper portion of said back panel, said hanging panel having an opening therein aligned with said opening in the back panel, and two pairs of first and second triangular panels articulately connected together and both triangular panels of each pair being substantially coplanar and lying flat against a respective one of said side panels, with one of said triangular panels in each pair being articulately connected to said top flap and the other triangular panel of each pair being articulately connected to a respective one of said side panels.

4,355,759

COMPOSITE CONTAINER AND METHOD

Ralph G. Amberg, Toledo, Ohio, assignor to Automated Container Corporation, Orlando, Fla.

Continuation-in-part of Ser. No. 896,251, Apr. 14, 1978, abandoned. This application Oct. 4, 1979, Ser. No. 81,960
Int. Cl.³ B65D 3/10, 5/00, 13/00
U.S. Cl. 229—5.5 1 Claim



1. An improved composite container comprising a cylindrical body defining a side wall of the container formed of plural laminated layers, the outer layer being aluminum foil covered by high gloss paper to form a label surface, the central layer comprising fibrous material, and the inner layer being com-

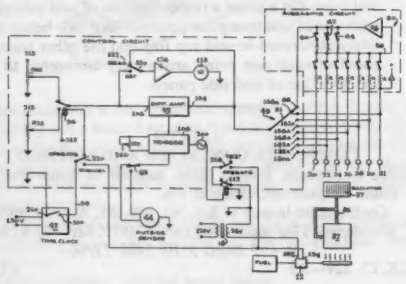
prised of a thermoplastic material, an integral end wall compression molded of the same thermoplastic material as said inner layer of the side wall and thermally bondable therewith, a peripheral flange on said end wall bonded under high pressure of compression molding to an axial end portion of said body side wall inner thermoplastic layer, said end portion of said body side wall being of reduced thickness and enhanced rigidity by the compression of the fibrous laminations during compression molding the end wall, the bonding pressure thereof impregnating the fibrous layer of the lamination by the inner layer of thermoplastic material, a second flange on said end wall parallel to said peripheral flange and compressively engaging the outer layer of said side wall providing a further reduction in thickness of the laminated side wall end portion, the axial height of said peripheral flange being on the order of four times the major thickness of the side wall of the laminated body, said second flange being of lesser axial height than the axial height of said peripheral flange, said second flange and said peripheral flange compressively engaging the reduced thickness end portion of said side wall, and the combined thickness of said peripheral and second flanges exceeding the major thickness of said laminated side wall of the container body.

4,355,760

CONTROL UNIT FOR A MULTI-UNIT BUILDING

Ernest D. Ruby, 4335 N. Francisco, Chicago, Ill. 06018

Filed Aug. 28, 1978, Ser. No. 937,110
Int. Cl.³ F24F *3/00*; G05D *23/00*
U.S. Cl. 236—47 **14 Claims**



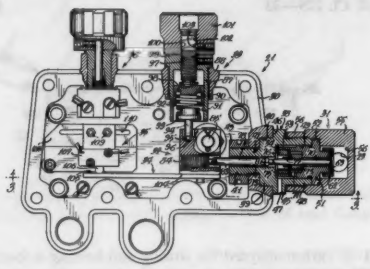
1. A heat control of the class described, comprising a plurality of temperature sensors, an averaging circuit, the electrical output of each temperature sensor connected to the input of the averaging circuit, the output of the averaging circuit being an electrical signal proportional to the average of the temperatures sensed by each temperature sensor, a comparator circuit, said comparator circuit including a reference electrical signal proportional to a reference temperature, the output of the averaging circuit and the reference electrical signal connected to the input of the comparator circuit, the output of the comparator circuit adapted to be connected to a heat producing device in such a way that the comparator circuit causes the heat producing device to turn on when the average of the temperature sensed by each temperature sensor is less than the reference temperature and turns the heat producing device off when the average of the temperatures is greater than the reference temperature and means connected to the output of each temperature sensor and the averaging circuit for providing an electrical signal at each sensor input to the averaging circuit to replace any signal lost by reason of a failure of a sensor or a line connected from a sensor to the averaging circuit, said electrical signal proportional to the lowest temperature likely to be encountered by a sensor in normal circumstances whereby the effect of said failure on the averaged output from the averaging circuit is minimized.

4,355,761

PRESSURE SENSOR AND REGULATOR FOR AIRLESS MATERIAL COATING SYSTEM

Thomas E. Bjorn, Northbrook, and Mark C. C. Kao, Elmhurst, both of Ill., assignors to Stewart-Warner Corporation, Chicago, Ill.

Filed Mar. 17, 1980, Ser. No. 131,191
Int. Cl.³ F04B *49/08*
U.S. Cl. 239—126 **17 Claims**



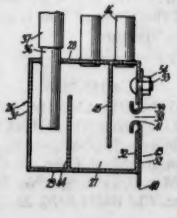
1. In an airless material spraying system, comprising; a material spray dispenser, a source of material, pump means for conveying material under pressure from a reservoir to the material spray dispenser, valve means for controlling flow from the pump means, a pressure responsive control for the valve means including housing means, said housing means having a chamber formed therein, means communicating the material outlet flow from the pump means to the chamber, flexible diaphragm means in the chamber movable in response to increasing material pressure in the chamber, a precision bore in the housing means, a sensor rod reciprocable in said housing means precision bore and engaging said diaphragm means, spring means urging said rod against said diaphragm means, stop means on the sensor rod for limiting movement of said rod away from the chamber to reduce the amount of flexing of the diaphragm means, and switch means responsive to a predetermined movement of said rod for actuating said means for controlling flow from the pump means.

4,355,762

APPARATUS FOR ESTABLISHING A LIQUID CURTAIN

John D. Coleman, Surrey Hills, Australia, assignor to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Division of Ser. No. 709,068, Jul. 27, 1976, Pat. No. 4,093,016, which is a division of Ser. No. 477,380, Jun. 7, 1974, Pat. No. 3,993,252. This application May 9, 1978, Ser. No. 904,353
Claims priority, application Australia, Jun. 7, 1973, 3579/73
Int. Cl.³ B05B *1/36*
U.S. Cl. 239—193 **4 Claims**



1. Apparatus for establishing a steady, falling curtain of liquid comprising a hollow structure defining a liquid receiving chamber, liquid inlet means, means for forcing a liquid into the chamber, a horizontal slot outlet having a rounded upper edge

for flow of liquid from the chamber and a wall portion of said structure which defines an external upright surface extending downwardly from the slot outlet and which terminates in a bottom blade edge disposed below said structure, whereby in use of the apparatus liquid is forced from the chamber through the slot outlet transversely of said surface then flows down said surface to establish a falling curtain of liquid which drops away from said surface at the blade edge.

4,355,763

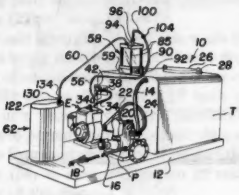
PESTICIDE SPRAY SYSTEM

Michael W. Brandt, 1111 W. Mockingbird La., Dallas, Tex. 75247

Division of Ser. No. 623,648, Oct. 20, 1975, abandoned, which is a continuation-in-part of Ser. No. 462,364, Apr. 19, 1974, Ser. No. 532,446, Dec. 13, 1974, Pat. No. 3,970,121, and Ser. No. 573,490, May 1, 1975. This application Feb. 5, 1979, Ser. No. 9,123

Int. Cl.³ A62C *13/52*

U.S. Cl. 239—302 **9 Claims**



1. Apparatus to transfer a measured quantity of pesticide from a container into a tank having a pump and spray nozzle associated therewith for spraying liquid pesticide comprising: a metering chamber; means supporting the metering chamber at an elevation above the elevation of the container and above the elevation of the tank; a liquid transfer line; means connecting the liquid transfer line to the container such that a first end of the transfer line extends below the surface of pesticide in the container; means connecting a second end of the liquid transfer line in communication with the inside of the metering chamber; a vacuum line; a syphonator tube; means securing said vacuum line to said tube; a float valve; means securing said float valve to said syphonator tube; means movably securing said syphonator tube to said metering chamber such that the position of said float valve is adjustable vertically to control the level of the surface of liquid in the metering chamber; means to remove fluid from said vacuum line to reduce pressure in the metering chamber such that pressure in the metering chamber is sufficiently less than pressure in the container to sustain flow of liquid from said container through said liquid transfer line to said metering chamber; and valve means between said metering chamber and said tank, said valve means being movable between a first position wherein fluid communication between said metering chamber and said tank is blocked and a second position wherein said metering chamber is in fluid communication with said tank.

4,355,764

LOW CAPACITANCE AIRLESS SPRAY APPARATUS

Alvin A. Rood, Oberlin, and Donald R. Hastings, Elyria, both of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Filed Jul. 17, 1980, Ser. No. 169,850

Int. Cl.³ B05B *5/02*

U.S. Cl. 239—708 **19 Claims**

1. An airless electrostatic spray apparatus comprising,

an elongated body of insulating material having two passages therethrough,

one of said passages being adapted to be connected with a supply of liquid coating material under sufficient pressure to effect airless atomization of said liquid coating,

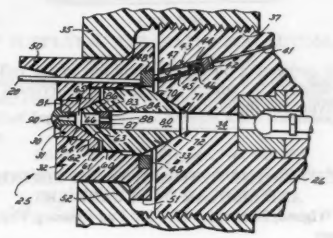
valve means for controlling flow of liquid coating material through said one passage,

electrical circuit means including electrical resistor means in the other of said passages, said circuit means being adapted to be connected to a source of electrical potential, and

a nozzle assembly comprising

a nozzle mounting ring of insulative material having an axial passage therethrough, said axial passage of said nozzle mounting ring being coaxially aligned with said one passage of said elongated body,

a nozzle support adapter, said adapter having an axial passage therethrough and being mounted within said axial passage of said mounting ring, said adapter being a single unitized piece of electrically conductive material,



an electrically conductive airless spray nozzle, said nozzle being fixedly mounted within said axial passage in said adapter,

electrically non-conductive sealing means operable between said adapter and said elongated body, and

an electrode mounted within said nozzle mounting ring, said electrode being electrically connected to said electrical circuit means but electrically insulated from said electrically conductive nozzle,

the mass of said electrically conductive nozzle and nozzle support adapter being sufficiently small and having a sufficiently low capacitance that there is no tendency for electrical current in said circuit means to arc between said electrode and said nozzle or nozzle support adapter and being sufficiently low in capacitance that any spark generated between said nozzle assembly and a grounded object is of a minimal safe energy level.

4,355,765

WEB GRANULATOR WITH NIP ROLLERS HAVING HOOKING MEMBERS

Frank Parker, and Leslie M. Parker, both of Old Brandon Rd., Hillsboro, Tex. 76645

Filed Apr. 23, 1980, Ser. No. 142,968

Int. Cl.³ B02C *18/22*

U.S. Cl. 241—152 A **9 Claims**

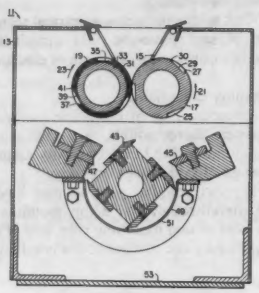
1. In a granulator of the type having a cutter assembly for granulating objects into particles, an improved means for forcing scrap material into the cutter assembly, comprising in combination:

a pair of nip rollers mounted adjacent the cutter assembly and driven in opposite directions, the rollers having portions of cylindrical surfaces in rolling contact with each other for drawing scrap sheet material between the rollers and into the cutter assembly; and

grabbing means formed on one of the rollers for seizing a portion of a three dimensional scrap object and crushing it against the other roller to tear the object and feed it into the cutter assembly;

the grabbing means comprising a hook member formed on one of the rollers, the hook member having a surface

facing the same direction as the direction of rotation for grabbing three dimensional objects; the hook member comprising:



a finger projecting outwardly from one of the rollers, and the other of the rollers having a circumferential slot for receiving the finger during rotation.

4,355,766

DEVICE FOR THE DESTRUCTION OF MICROFILM AND SIMILAR DATA CARRIERS

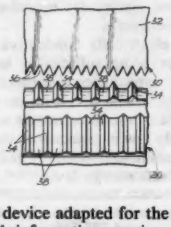
Gerhard Wigand, Enzstrasse 17, 7140 Ludwigsburg, Fed. Rep. of Germany

Continuation of Ser. No. 126,847, Mar. 3, 1980, abandoned, which is a continuation of Ser. No. 898,174, Apr. 20, 1978, abandoned. This application Oct. 17, 1980, Ser. No. 198,220

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1977, 2717522; Apr. 30, 1978, 2815973

Int. Cl.³ B02C *18/18*

U.S. Cl. 241—222 **7 Claims**



1. In a shredding device adapted for the destruction of microfilm and related information carriers with microimage impressions, a shredding unit comprising in combination:

a stationary frame;

a shredding cutter which is rotatably supported on the frame and connected to a cutter drive, the cutter having the general configuration of a cylindrical milling cutter, with an even number of angularly spaced longitudinal cutting edges arranged on the cutter periphery; and

a stationary cutting member supported on the frame and forming a stationary cutting edge which is so positioned that it cooperates with the moving cutting edges of the rotating shredding cutter to produce a shearing action therewith; and wherein

the stationary cutting edge defines a stationary cutting profile of zigzag outline, similar to the profile outline of a regular screw thread, with triangular teeth and V-shaped grooves;

the moving cutting edges of the shredding cutter define first-position and second-position moving cutting profiles alternating with one another along the cutter circumference, both moving cutting profiles having triangular teeth spaced at twice the longitudinal pitch of the cooperating V-shaped grooves of the stationary cutting edge, so as to produce a shearing action with every other of said grooves; and

the first position moving cutting edges are longitudinally offset from the second-position moving cutting edges by the amount of said pitch; with the result that at every pass of a moving cutting edge at the stationary cutting edge against an advancing sheet of information carrier, a plurality of short, V-shaped slivers are sheared from the latter.

4,355,767

DEVICE IN GRINDING APPARATUS

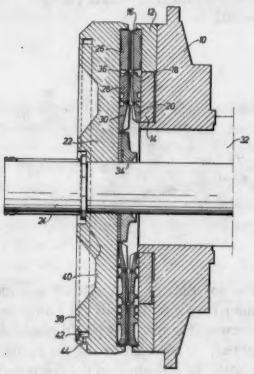
Inge J. G. Johansson, Taby, Sweden, and Rolf B. Reinhall, Bellevue, Wash., assignors to Defibrator Aktiebolag, Stockholm, Sweden

Filed Aug. 22, 1977, Ser. No. 826,537

Claims priority, application Sweden, Sep. 10, 1976, 76100627

Int. Cl.³ B02C *7/12*

U.S. Cl. 241—244 **1 Claim**



1. In a grinding apparatus in which lignocellulose-containing material is ground in a grinding space defined between a stationary disc and a rotating disc, the rotating disc on one face thereof having a plurality of grinding segments to be maintaind in close tolerance spacing relative to cooperating grinding segments on the stationary disc, and on the opposite face an annular bulging peripheral portion for counteracting the deflective centrifugal force on the rotating disc segments, the improvement comprising an annular channel in said bulging portion for receiving mercury in an amount calculated to generate during the rotation of the disc having the bulging peripheral portion a counter centrifugal force equal to the deflecting centrifugal force exerted on the rotating grinding segments to thereby maintain the close tolerance spacing between the cooperating grinding segments.

4,355,768

ROTARY GRINDING DISC FOR DEFIBRATING APPARATUS

Johan G. I. Johansson, Falkvägen, Sweden, assignor to Defibrator Aktiebolag, Stockholm, Sweden

Division of Ser. No. 16,320, Feb. 28, 1979, Pat. No. 4,274,602. This application Apr. 16, 1981, Ser. No. 254,650

Claims priority, application Sweden, Mar. 3, 1978, 7802471

Int. Cl.³ B02C *7/04*

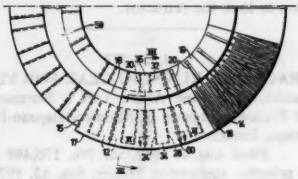
U.S. Cl. 241—261.3 **2 Claims**

1. In a defibrating apparatus in which fibrous pulp material, such as wood chips, is ground in an interspace defined between two opposed relatively rotating discs (10) having a central opening for introducing the material into a central feed-in zone and supporting a plurality of arcuate grinding plate segments defined between two outwardly diverging radial side walls (48,

50) and disposed annularly about the rotating disc, said grinding plate segments having a frontal grinding surface comprising ribs (14) and ridges (16), and a rear surface for engaging said discs, the improvement providing relatively thin and relatively light segment plates comprising:

(a) dovetail-shaped grooves (22) in said discs (10) defined between diverging side walls (44,46) and extending with progressively decreasing width from an inner radial portion of said discs toward a radially outer portion thereof;

(b) tongues (34) projecting from the rear surface of said



grinding plate segments for engaging said dovetail-shaped grooves (22);

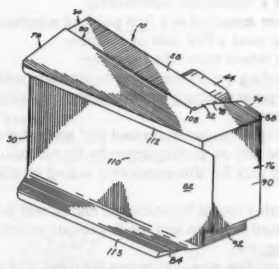
(c) one of said diverging radial side walls (48, 50) each plate segment being parallel to one of said diverging side walls (44, 46) of said grooves, while the other one of said diverging radial side walls (48, 50) of each plate segment diverges in a radially outward direction relative to said grooves to permit insertion of said plate segments into said grooves from said central opening and thereby wedge said tongues (34) in dovetail fashion in said grooves during rotation of the disc.

4,355,769

IMPELLER SHOE ASSEMBLY

Kenneth D. Warren, and Gregory G. Tenold, both of Spokane, Wash., assignors to Spokane Crusher Mfg. Co., Spokane, Wash.

Filed Jun. 16, 1980, Ser. No. 160,068
Int. Cl.[3] B02C *19/06*
U.S. Cl. 241—300 4 Claims



1. An impeller shoe assembly for directing material radially outward from a central distribution disc on a horizontal turntable of a vertical shaft centrifugal impact crushing machine to impact the material against stationary anvils circumscribing the turntable, comprising:

an elongated supporting base member having a bottom face, a top face, a back face and a front face extending from an inner end to an outer end, with securing means projecting from the back face to releasably secure the base member to a turntable bracket with the back face engaging the bracket;

an inner end of the base member having a shoulder surface;

said front face of the base member having a longitudinal female dovetail groove formed therein extending from the inner end face towards the outer end face intermediate the bottom face and the top face;

an elongated wear resistant member having a bottom face, a top face, back face and a front face extending from an inner end to an outer end with the front face directing the material therealong radially outward from the central disc to impact against the stationary anvils;

said back face of the wear resistant member having a longitudinal male dovetail projection formed therealong extending from the outer end toward the inner end between the bottom and top faces for interfitting within the complementary dovetail groove to releasably secure the wear resistant member to the supporting base member; and

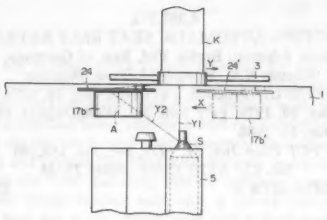
said back face of the wear resistant member having an abutment surface for engaging the shoulder surface to position the wear resistant element longitudinally relative to the supporting base member to minimize wear of the supporting base member.

4,355,770

COP SUPPLYING APPARATUS FOR AUTOMATIC WINDING MACHINE

Buro Suganuma, Nagaokakyoshi; Noboru Sekitani, Hirakatashi; Yasuaki Hatanaka, and Yasuhiro Inoue, both of Nagaokakyoshi, all of Japan, assignors to Murata Kikai Kabushiki Kaisha, Japan

Filed Mar. 11, 1980, Ser. No. 129,364
Claims priority, application Japan, Mar. 13, 1979, 54-29653
Int. Cl.[3] B65H *54/26, 67/02*
U.S. Cl. 242—35.5 A 5 Claims



1. In cop supplying apparatus for an automatic winding machine wherein a cop supplying truck runs along individual winding units of the automatic winding machine and cops are dropped into magazines of the winding units from the cop supplying truck, without the truck stopping at the individual winding units, through a long hole in a bottom plate of the cop supplying truck and wherein the cops on the cop supplying truck are driven over the long hole at substantially the speed of the cop supplying truck so that their speed at the individual winding units is substantially zero with respect to the winding units, means operable between the cop supplying truck and the magazines of the winding units for preventing spreading of yarn from cops dropped into one magazine from the cop supplying truck to an adjacent magazine.

4,355,771

TRANSFER MECHANISM IN THE WINDING OF STOCK MATERIAL

Joseph H. Hollier, Jr., Pearcy, Ark., assignor to Sutco, Inc., Hot Springs, Ark.

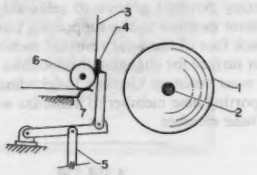
Filed Jun. 11, 1980, Ser. No. 158,514
Int. Cl.[3] B65H *19/26*
U.S. Cl. 242—56 R 3 Claims

1. In a device for winding a web of stock material on a spool on a cantilevered support to prepare a package, the improvement therein for: (a) facilitating removal of a finished package after severing of the web therefrom and (b) facilitating the positioning of the severed end of the web and the subsequent

attachment thereof to a new spool which has been placed on the support; the improvement comprising:

(1) a guide roll located upstream of the cantilevered support and in proximity thereto, over the surface of which guide roll the web passes on its way to the package;

(2) a resilient strap anchored in proximity to the guide roll and extending to engage the surface thereof, so that the web is urged by the resilient strap against the surface of the guide roll, over which surface the web passes on its way to the package; and



(3) lifting means for raising the severed end of the web away from the surface of the finished package and supporting the severed end of the web in a raised position until the finished package has been removed from the cantilevered support and a new spool has been placed thereon, whereupon the lifting means is lowered so that the severed end of the web is positioned in contact with the surface of the new spool for attachment thereto, and subsequent commencement of the winding operation.

4,355,772

FAST ACTING AUTOMATIC SEAT BELT RETRACTOR

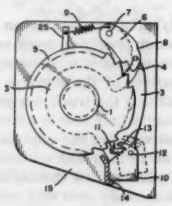
Heinz-Dieter Adomeit, Berlin, Fed. Rep. of Germany, assignor to N.V. Klippan S.A., Heverlee-Leuven, Belgium

PCT No. PCT/DE79/00060, § 371 Date Oct. 19, 1979, § 102(e) Date Oct. 19, 1979, PCT Pub. No. WO80/02823, PCT Pub. Date Dec. 24, 1980

PCT Filed Jun. 21, 1979, Ser. No. 253,768

Int. Cl.³ A62B *35/02;* B65H *75/48*

U.S. Cl. 242—107.4 A **10 Claims**



1. A rapid locking automatic seat belt retractor comprising a main housing, a shaft rotatably mounted in the housing with a seat belt wound thereon, a rewind spring for the shaft, a locking mechanism comprising a vehicle inertia sensor, a movably mounted locking element, a locking gear connected to said shaft for rotation therewith and a control member for engaging the locking element with the locking gear to lock the retractor, and a rotational shaft acceleration sensing means capable of actuating the locking element to engage the locking gear upon excessive belt acceleration characterized in that:

the control member comprises a pivotable plate (3) mounted about shaft (1), the plate (3) having a portion (4) directly engageable with the locking element (6) to move the locking element (6) to engage the locking gear (5);

a housing (10) for the inertia sensor, said housing being integral with said plate (3) and a pawl (11) provided on the housing (10), and means rotatable with said shaft and engageable by said pawl, whereby when said pawl (11) is moved by said inertia sensor to engage said rotatable means further unwinding rotation of said shaft (1) pivots said pawl (11), housing (10) and integral plate (3) to cause locking element (6) to engage locking gear (5) thereby locking the shaft;

and wherein the locking element (6) and locking gear (5) are mounted on the exterior of main housing (15), the portion (4) of plate (3) acting to directly pivot locking element (6) upon pivoting of plate (3); and

the rotational acceleration sensing means (18,20) actuates pivoting movement of plate (3) upon excessive belt acceleration to lock the retractor.

4,355,773

RETRACTABLE RUNNING GEAR FOR VEHICLE

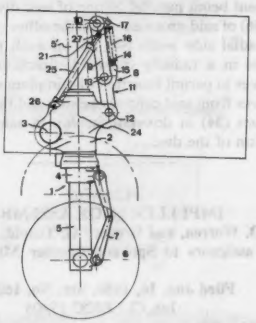
Jean Masclet, Paris, and Andre Turiot, Normandie-Niemen, both of France, assignors to Messier-Hispano-Bugatti (SA), Montrouge, France

Filed Aug. 8, 1980, Ser. No. 176,498

Claims priority, application France, Sep. 13, 1979, 79 22926; Jun. 27, 1980, 80 14312

Int. Cl.³ B64C *25/10, 25/26*

U.S. Cl. 244—102 R **9 Claims**



1. Retractable rolling apparatus for a vehicle, in particular, an airplane or a helicopter, comprising:

a leg member mounted at a first point of attachment on said vehicle around a first axis of rotation;

at least one wheel secured to said leg;

a strut including a rod adapted to be fixed on said vehicle at a second point of attachment thereon and having a second axis of rotation;

a lever pivotally mounted on said rod around a a third axis of rotation and on said leg around a fourth axis of rotation;

an actuating jack for simultaneously acting on said strut and said leg;

first connecting means between one end of said jack and said leg at a third point on said leg to provide rotational torque to said leg; and

second connecting means between the other end of said jack and a fourth point of attachment on said strut to provide rotational torque to said strut, said third and fourth points being spaced apart from said first and second points of attachment and substantially in the proximity respective of said first and second points of attachment.

4,355,774

PARACHUTE INFLATION ASSISTANCE DEVICE

Garland C. Koenig, 1845 Tara Dr., Prattville, Ala. 36067

Continuation-in-part of Ser. No. 19,627, Mar. 12, 1979, abandoned. This application Sep. 16, 1980, Ser. No. 187,795

Int. Cl.³ B64D *17/02, 17/62*

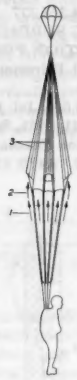
U.S. Cl. 244—145 **12 Claims**

1. In a parachute inflation assistance device for use on a

circular canopy having a skirt at the lower end thereof and a lateral band at the upper end thereof,

(a) external gores covering selected areas of said circular canopy with each said external gore having lateral edges which flare downwardly from said upper lateral band and terminate at an elevation ranging from approximately 4 to 14 inches above and in spaced relation to the skirt of said circular canopy,

(b) means joining said lateral edges of each said external gore to the adjacent surface of said circular canopy which it covers with the width of said external gore being greater



than that of said surface which it covers to define a generally radially extending compartment therebetween having an upper closed end and an open lower end, each said compartment quickly filling with air upon parachute extraction so as to rapidly open said canopy at the skirt first thereby forcing the canopy to fill from the skirt upwards to the apex in a rapid filling sequence, and

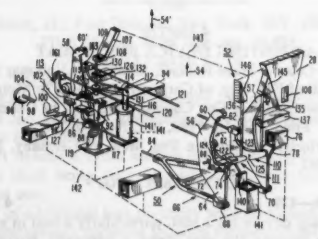
(c) there being an anti-oscillation vent slot in the upper one-third portion of each said external gore for release of air from said compartment defined between said external gore and the surface of said circular canopy which it covers.

4,355,775

SPACECRAFT SEPARATION APPARATUS

Eugene R. Gansle, Skillman, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 22, 1979, Ser. No. 86,796
Int. Cl.³ B64G *1/64*
U.S. Cl. 244—158 R **8 Claims**



1. A spacecraft separation apparatus comprising:

a support structure,

means for releasably securing said spacecraft to said structure, and

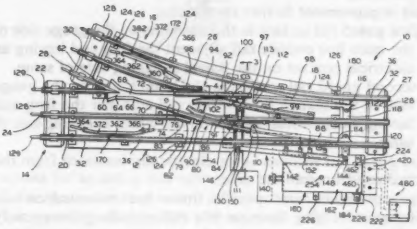
spacecraft separation and acceleration means secured to said structure comprising means for applying distributed separate forces in the same direction and during equal, simultaneous time intervals to said spacecraft at at least three spaced points in a direction away from said structure to accelerate said spacecraft in said direction, the lines joining said points forming a triangle, the area containing these lines extending in a direction parallel to the forces forming a triangular tube, the center of gravity of said spacecraft being located within said triangular tube, whereby upon release of said spacecraft by said means for securing, said spacecraft separates from said structure by translating in said direction without rotation.

4,355,776

TOY RAILROAD TRACK SWITCH ARRANGEMENT

Carl N. Rydin, 4S556 River Rd., Naperville, Ill. 60540

Filed Oct. 2, 1980, Ser. No. 193,138
Int. Cl.³ B61L *5/06, 11/08;* E01B *7/00*
U.S. Cl. 246—415 A **14 Claims**



1. In a toy railroad track switch assembly for toy electric railroad trains of the type having a locomotive equipped with an electrical pick up power rail riding rollers, with the train locomotive and cars being equipped with rail engaging wheels for riding on the track, said switch assembly including a flat base, main and branch line track rails merging in track switch relation on the base including outside continuous main and branch line wheel bearing side rails, a wheel bearing frog having a heel and a toe, inside main and branch line wheel bearing side rails merging at the heel of the wheel bearing frog, a main line power rail centered between the main line side rails and interrupted adjacent the frog toe to define interruption end portions, a branch line power rail centered between the branch line side rails and having an end portion merging with the main line power rail, said branch line power rail being interrupted adjacent the frog toe to define interruption end portions, a pair of switch points pivotally mounted at like ends on the base to dispose their other ends in projecting relation from the branch line rails and within the outside rails, with the other ends of said switch points being mounted for movement into and out of switching relation with the respective outside rails, and rail sections secured to the base connecting the frog toe with the respective switch points said one ends through said power rail interruptions,

the improvement wherein:

said rail sections each comprise:

a main line center rail continuity rail structure interposed within the main line power rail interruption in overlapping relation with the respective main line power rail interruption end portions, and comprising a first transfer rail aligned with the branch line inside rail and extending between frog toe and said one end of the switch point on the main line outside rail side of the switch assembly, and a guard rail adjacent and electrically connected to said first transfer rail on the gauge side of same,

said main line center rail continuity rail structure being electrically insulated from said power rails, and being positioned for continuous electrical power pick up engagement therealong by the power rail riding roller as the train moves across said main line center rail continuity

structure and the power rail riding roller rides the main line center rail continuity rail structure along and between the respective main line power rail interruption end portions,

a branch line center rail continuity rail structure interposed within the branch line power rail interruption in overlapping relation with the respective branch line power rail interruption end portions, and comprising a second transfer rail aligned with the main line inside rail and extending between the frog toe and said one end of the other switch point, and a guard rail adjacent an electrically connected to said second transfer rail on the gauge side of same,

said branch line center rail continuity rail structure being electrically insulated from said power rails and from said main line continuity rail structure, and being positioned for continuous electrical power pick up engagement therealong by the power rail riding roller as the train moves across said branch line center rail continuity rail structure and the power rail riding roller rides the branch line center rail continuity rail structure along and between the respective branch line power rail interruption end portions,

said improvement further comprising:

a first guard rail section in the main line on the gauge side of the main line outside rail adjacent the frog and having an electrical contact on the wheel engaging side of same,

a second guard rail section in the branch line on the gauge side of the branch line outside rail adjacent the frog and having an electrical contact on the wheel engaging side of same,

said guard rail sections being electrically insulated from the main and branch line rails,

a pair of spaced apart parallel throw bars mounted on said base, underlying the main line and extending transversely of same, for movement lengthwise of the respective throw bars,

one of said throw bars having said other ends of said switch points secured thereto for said mounting of same for effecting said switching relations with the respective outside rails, and the other of said throw bars being disposed under said continuity rail structures,

a cross lever extending between said throw bars adjacent to and outside of the main line outside rail and pivotally connected therebetween,

said cross lever being pivoted intermediate its ends to the base for pivotal movement about an axis extending normally of the base,

said other throw bar including a contact plate movable therewith and electrically connected to one of said power rails and being proportioned lengthwise of said other throw bar to electrically engage said branch line continuity rail structure, to the exclusion of said main line continuity rail structure, when said switch points are disposed for branch line travel, and to electrically engage said main line continuity rail structure, to the exclusion of said branch line continuity rail structure, when said switch points are disposed for main line travel,

means for power shifting one of said throw bars longitudinally thereof in opposite directions lengthwise thereof for power shifting both of same through said cross lever between their respective operating positions,

said power means comprising electrically operated oppositely acting thrust means including solenoid means for actuating same, with said solenoid means being electrically connected to one of the power rails,

each of said guard rails section contacts being electrically connected to said solenoid means by a trigger circuit for separately actuating said power means when a train moves through the switch assembly in a predetermined direction on the branch line to the main line, or in the same direction on the main line,

whereby, when a train moves through the main line of the switch assembly in the predetermined direction, the switch points have their said other ends disposed for main line passage of the train through the switch assembly and said main line continuity rail structure is energized for continuous electrical power pick up therealong by the power rail riding roller during such train main line passage through the switch assembly, and when a train moves through the switch assembly branch line to its main line, the switch points have their said other ends disposed for switching of the train to the main line and said branch line continuity rail structure is energized for continuous electrical power pick-up therealong by the power rail riding roller during such branch line to main line passage through the switch assembly.

4,355,777

VIBRATION ISOLATING SURFACE PROTECTOR WITH HIGH TRACTION PROPERTIES

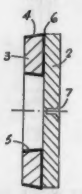
James G. Greenstreet, 270 Fairmont Ave., Ottawa, Ontario, Canada (K1Y 1Y2)

Continuation of Ser. No. 58,652, Jul. 19, 1979, abandoned. This application Oct. 21, 1981, Ser. No. 313,410

Claims priority, application Canada, Dec. 11, 1978, 317670

Int. Cl.³ A47B *91/00*

U.S. Cl. 248—346 **3 Claims**



1. A surface protection device comprising: a flat substantially rigid backing plate of predetermined contour having front and rear surfaces, said rear surface having a recess means for the location of a cooperating load-source device, said front surface having a compliant soft resilient matching slab cushion in retentive intimate contact therewith, said cushion having disposed on edges thereof integral surrounding outer and annular inner thin skin-like compliant membrane portions arranged in symmetrical relationship, said outer and inner membrane portions respectively converging and diverging progressively away from said front surface of said plate at an angle between 1° and 10° with respect to an axis normal to said front surface thereby forming a pressure sensitive hollow substantially conical frustrum by means of which said cushion and said membrane portions mutually cooperate to produce high frictional properties in conjunction with a working surface when light loads are applied in a direction approximately normal to said rear surface at said recess means.

4,355,778

ADJUSTING DEVICE FOR A SEAT

Peter Hess, Coburg; Hans Rampel, Ahorn, and Volkmar Schulz, Coburg, all of Fed. Rep. of Germany, assignors to Metallwerk Max Brose GmbH & Co., Coburg, Fed. Rep. of Germany

Filed Apr. 16, 1980, Ser. No. 140,748

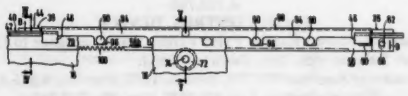
Claims priority, application Fed. Rep. of Germany, May 9, 1979, 2918761

Int. Cl.³ F16M *13/00*

U.S. Cl. 248—429 **4 Claims**

1. Adjusting device for a seat, particularly a seat in a motor vehicle, for moving the seat along a generally horizontally extending given direction, comprising a sliding seat guide mechanism, said sliding seat guide mechanism comprising a first part arranged to mount the seat and a separate second part located below said first part, said first part including a tubular upper part arranged to be connected to the seat, an elongated rack extending in the given direction and connected to one of

said first and second parts and a pinion connected to the other one of said first and second parts, said rack disposed in meshed engagement with said pinion for moving said first and second parts relative to one another, wherein the improvement comprises that said rack is supported so that it can be adjustably displaced in a generally vertically extending direction extending transversely of the given direction for providing a predetermined dimension between said rack and the axis of said pinion, and a guide member mounted on said second part and extending into contact with said rack for maintaining the predetermined distance between said rack and the axis of said pinion, said first part includes two pair of L-shaped stampings located one above the other, each said pair of stampings being located adjacent and in contact with the bottom surface of an opposite end of said tubular upper part, each of said stampings having a horizontally extending leg and a vertically extending leg depending downwardly from said horizontally extending leg, said horizontally extending legs disposed in contact with one another and said vertically extending legs disposed in laterally spaced and general parallel relation, said rack extending between said pairs of stampings with said rack located



between and secured to said vertically extending legs, said rack has a set of teeth thereon facing downwardly, said rack having a vertically extending oblong hole therethrough, a rivet extending through said vertically extending legs and said oblong hole for connecting said rack to said pair of stampings, a support member connected to and extending upwardly from said second part, a guide rail supported on the upper end of said support member, said horizontally extending legs of said stampings slidably mounted on said guide rail, webs extending downwardly from said horizontally extending legs and disposed on opposite sides of and closely adjacent to said guide rail, a support stirrup secured to said support member intermediate said pairs of stampings and extending upwardly therefrom and located laterally outwardly from said rack, said support stirrup having a free end located upwardly from said rack, a drive shaft extending transversely of and supported in said support member and support stirrup, said pinion mounted on said drive shaft and located below and in meshed engagement with said teeth on said rack, and said guide member is secured to said support stirrup above said rack, the upper edge of said rack being smooth, and said guide member is maintained in contact with the smooth upper edge of said rack.

4,355,779

COLLAPSIBLE STAND FOR SHEET MUSIC AND THE LIKE

Simca Heled, 211 East 70th St., New York, N.Y. 10021

Filed Mar. 2, 1979, Ser. No. 16,881
Int. Cl.³ A47B *97/04*
U.S. Cl. 248—460 **8 Claims**

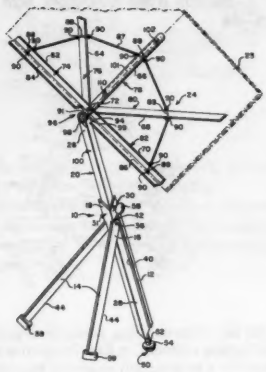
1. A stand for sheet music and the like comprising:

a first leg having a longitudinally extending non-circular bore open at one end;

a shaft having a cross section corresponding to said bore, said shaft being slidable within said bore through said open end;

a pair of additional legs pivotally secured to said first leg at a substantially common location for movement between a collapsed position wherein said additional legs are substantially aligned with said first leg and an open position wherein said additional legs extend outwardly from said first leg and said three legs collectively define a generally pyramidal base;

a support including a plurality of arms pivotally secured together at one end, said arms being movable between a collapsed position wherein said arms are substantially aligned and an open position wherein said arms are out of alignment for defining a supporting surface for said sheet music and the like; each of said arms having an aperture therein and further comprising a knotted flexible member secured to said support and extending through said apertures, said knots being larger than said apertures and spaced for holding said arms in said open position; and



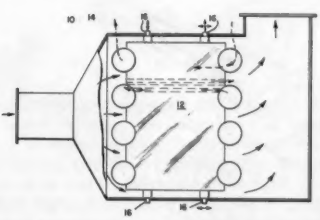
means for securing said support to the free end of said shaft for movement between a collapsed position wherein said support is substantially aligned with said first leg when said arms are collapsed and said shaft is substantially fully received in said bore, and an open position wherein said support extends beyond the free end of said shaft and the weight of said support is distributed about an axis extending through said common location and perpendicular to the horizontal when said arms are in said open position.

4,355,780

HEAT EXCHANGER MOUNTING DEVICE

David G. Bridgnell, Rolling Hills, and Frederick W. Jacobsen, Garden Grove, both of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 597,049, Jul. 18, 1975, Pat. No. 4,216,937, which is a division of Ser. No. 447,906, Mar. 4, 1974. This application Mar. 17, 1980, Ser. No. 130,674
Int. Cl.³ F16M *1/00*; F28F *7/00*
U.S. Cl. 248—675 **33 Claims**



1. A mount for supporting a heat exchanger core within a housing having inwardly extending post means, said mount comprising:

at least one layer of metallic hollow core structure means for floatably supporting said core within the housing;

support means cooperative with said structure means;

socket means having an opening within said mount for releasably attaching said mount to said post means;

means affixing an inner end of said metallic hollow core structure against the core;

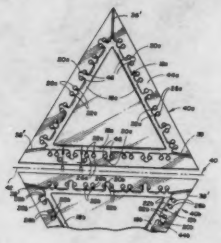
wherein said metallic hollow core structure comprises radially disposed fins.

4,355,781

KIT FOR ASSEMBLING GEODESIC STRUCTURE

Roger M. Stolpin, 1629 Ohio Ave., Flint, Mich. 48055

Division of Ser. No. 101,398, Dec. 7, 1979, Pat. No. 4,309,852.
This application Oct. 30, 1981, Ser. No. 316,611
Int. Cl.³ B28B 7/16, 7/20, 7/28
U.S. Cl. 249—64 4 Claims



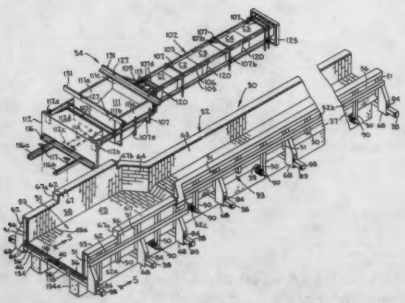
1. A die for injection molding plastic polygonal panels having male and female connection lugs for connecting a plurality of such panels by a snap action assembly to provide an assembled structure, said die comprising: a pair of die sections; each die section including a cavity section such that the die sections cooperate to define a cavity within which the injection molding of the panel can be performed; inserts received within the cavity to provide depressed connection surfaces on one set of the connection lugs; and resilient mounts for resiliently positioning the inserts on one of the die sections while permitting movement thereof with respect thereto so that a molded panel can be conveniently removed from the die sections without a die lock situation that would prevent such removal.

4,355,782

MOLD FOR FORMING FIREPLACES

Ray J. Scholz, Los Altos; William C. Southern, Los Gatos, and Leslie R. Wieduwilt, Jr., Cupertino, all of Calif., assignors to Sierra Precast, Inc., San Jose, Calif.

Filed Jan. 26, 1981, Ser. No. 228,149
Int. Cl.³ B28B 7/22
U.S. Cl. 249—93 8 Claims



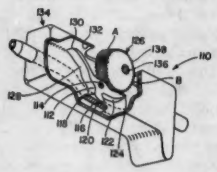
1. In a mold, a first mold section having a concrete-engaging surface bounded by two spaced side edges, second and third sections, and means mounting said second and third sections on opposite sides of said first section for translatory movement into sealing contact with said side edges of said first section, said mounting means including a plurality of roller assemblies carried by each of said second and third sections, each assembly including a pair of plates mounted in spaced parallel relation on the associated mold section, each plate having a pair of aligned slots, each slot in one plate being in alignment transversely of the plates with a slot in the other plate, a pair of shafts, each shaft extending through a pair of transversely aligned slots, each shaft having a threaded hold adjacent each end, an internally-threaded member carried by each plate adjacent each slot, a screw threaded through one of said internally-threaded members and through a threaded hole in an adjacent shaft, and a roller disposed on each shaft.

4,355,783

FLOW CONTROL DEVICE

Marius J. Morin, Rancho Palos Verdes, Calif., assignor to Cutter Laboratories, Inc., Berkeley, Calif.

Division of Ser. No. 957,778, Nov. 6, 1978, Pat. No. 4,265,425.
This application Feb. 17, 1981, Ser. No. 235,357
Int. Cl.³ F16K 7/06
U.S. Cl. 251—9 3 Claims



1. A hand-held flow control device for use with a length of flexible tubing wherein fluid flow through said tubing is controlled without contact between said device and said fluid, comprising:

(a) a body member fixably mounted to a portion of said length of tubing and providing a clamping surface;

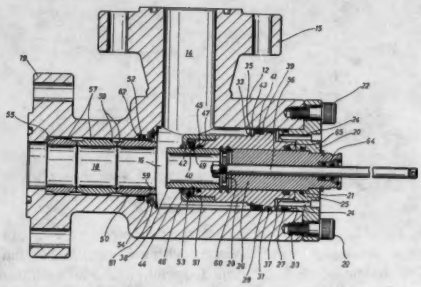
(b) a clamping member rotatably attached, at a central portion thereof, to the body member and having a first extension extending from the central portion for progressively clamping said tubing against said clamping surface as the clamping member is rotated, having a second extension extending from the central portion for engaging a force-inducing member to cause rotational movement, said first extension being shorter than the second extension and angled relative thereto to create a mechanical advantage in clamping said tubing and a third extension, integrally formed on the clamping member, projecting in a direction generally away from said first and second extensions to contact a portion of said body member when the force-inducing member is being urged against the second extension, said contact providing a spring-like bias to urge the clamping member away from said flexible tubing; and

(c) said force-inducing member being rotatably attached, at a point of rotatable attachment, to said body member in opposing relation to said second extension to provide a cammed peripheral surface so that rotation of the force-inducing member in one direction causes said outer surface to contact and pivot said clamping member to progressively clamp said tubing.

4,355,784
METHOD AND APPARATUS FOR CONTROLLING BACK PRESSURE

Lester L. Cain, Houston, Tex., assignor to Warren Automatic Tool Company, Houston, Tex.

Filed Aug. 4, 1980, Ser. No. 174,826
Int. Cl.³ F16K 31/122
U.S. Cl. 251—63 16 Claims



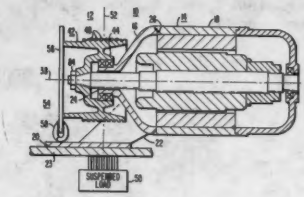
1. A back pressure control choke comprising:
a housing having an inlet channel intersecting with an axial bore, with one end of the axial bore defining a discharge channel for fluid passing through the choke;
a choke seat member concentrically mounted within the axial bore between the inlet channel and the discharge channel, the choke seat member having a generally cylindrical internal surface;
a mandrel, fixed to the housing, coaxially extending into the axial bore in that portion of the axial bore opposite the discharge channel;
a shuttle, slideably mounted on the mandrel within the axial bore, the surface area of the forward axial end of the shuttle facing the discharge channel being substantially equal to the surface area of the rear axial end of the shuttle;
a first dynamic seal means between the shuttle and the axial bore of the housing;
a second dynamic seal means between the shuttle and the mandrel such that a closed chamber is formed within the axial bore by the rear of the shuttle, mandrel and housing;
a choke element mounted to the forward end of the shuttle, cylindrically shaped and concentric with the axial bore, the choke element having a predetermined size permitting insertion and withdrawal from the choke seat member; and
a means for applying fluid pressure to the closed chamber and the rear axial end of the shuttle, thereby controlling the movement of the shuttle and choke element relative to the choke seat member and the back pressure exerted on the fluid passing through the choke.

4,355,785
ELECTRICALLY DRIVEN SHEAVE

Lawrence P. Tosato, Millburn, and Clyde M. Mullis, Glen Rock, both of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 23, 1981, Ser. No. 237,017
Int. Cl.³ B66D 1/12, 3/20, 5/12
U.S. Cl. 254—362 13 Claims

8. An electrical drive, comprising:
a drive motor having a stator, and a rotor within said stator, said stator including a housing having first and second ends, said housing including a tubular portion adjacent to its first end which has an interior surface defining a first opening, and an exterior surface,
first and second bearing means supported by said stator, with the first bearing means being mounted on the exterior surface of said tubular housing portion,
and a sheave, said sheave being mounted for rotation on said first bearing means,
said rotor including a drive shaft having a first end which extends through said first opening into driving engagement with, and support by, said sheave, and a second end support by said second bearing means,

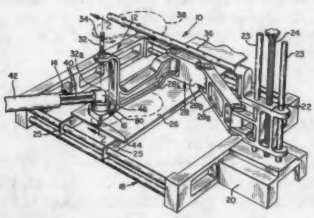


whereby a load applied to said sheave is supported by said first bearing means and said housing, enabling the drive shaft of said rotor to be sized only according to torque requirements.

4,355,786
TORCH MOUNTING APPARATUS IN A CUTTER MACHINE

Robert H. Hamilton, Jr., 2688 11th Ave., and Steven E. Adams, 3328 Columbine, both of Lebanon, Oreg. 97355

Filed Aug. 18, 1981, Ser. No. 293,927
Int. Cl.³ B23K 7/10
U.S. Cl. 266—62 3 Claims



1. Apparatus adapting a guide device for use with a cutting torch, where the guide device includes an articulated arm having a distal end which is freely movable in a plane, and means adjacent said distal end adapted to engage a pattern template as the arm is guided by such a template in such plane, and where the torch includes a handle and an elongated nozzle disposed at an angle relative to the handle and having a flame-directed cutting axis, said apparatus comprising
a bushing adapted for releasable clamping onto such a nozzle, and
means formed adjacent said distal end for receiving said bushing freely for rotational movement with respect thereto about the nozzle's cutting axis, with such axis disposed substantially normal to said plane, and directed into said zone, enabling arm-guided movement of the torch by manipulation of the torch's handle.

4,355,787

METHOD OF CONTROLLING THE NOZZLE DAMPER OF A METALLURGICAL VESSEL

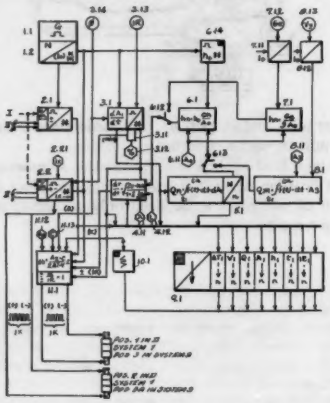
Heinz D. Hannes, Düren-Echtz; Josef Lothmann, Langerwehe, and Ludwig Walther, Düren-Niederau, all of Fed. Rep. of Germany, assignors to Zimmermann & Jansen GmbH, Düren, Fed. Rep. of Germany

Filed Jul. 2, 1980, Ser. No. 166,695

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1979, 2926863

Int. Cl.³ C21D 11/00

U.S. Cl. 266—92 13 Claims



1. A method of controlling the nozzle damper of a vessel for metallurgical casting in response to a level variation in the volume of molten metal tapped from said vessel comprising the steps of:

(a) monitoring the actual damper opening area from an initial time;

(b) determining the volume of the molten metal discharged from said vessel from said initial time by integrating the previous actual opening areas monitored by said step (a);

(c) determining the vertical level of molten metal above said nozzle damper in response to said step (b); and

(d) stepwise adjusting the position of said nozzle damper in response to said step (c).

4,355,788

HOT METAL RUNNER SYSTEM WITH AIR POLLUTION CONTROLS

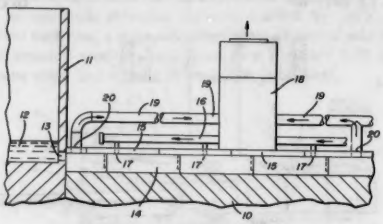
Micheal D. La Bate, 115 Hazen Ave., Ellwood City, Pa. 16117

Continuation-in-part of Ser. No. 133,356, Mar. 24, 1980, Pat. No. 4,300,753, which is a continuation-in-part of Ser. No. 123,369, Feb. 21, 1980, Pat. No. 4,262,885. This application Jun. 12, 1981, Ser. No. 273,018

Int. Cl.³ F27D 3/14

U.S. Cl. 266—157 8 Claims

1. An improvement in a closed ferrous metal runner system for a hot metal pouring floor, said system extending from a source of molten metal to a pouring point thereof, the improvement comprising means for preventing air pollution of the pouring floor environment, said runner system comprising the combination of a plurality of elongated trough-like body members arranged in end to end relation, each of the members having an integral base with spaced parallel upstanding side sections and a plurality of elongated slab-like covers positioned in end to end relation on said plurality of trough-like body members arranged to prevent fluid communication between said covered trough-like members and the environment surrounding the same, said air pollution preventing means including means in communication with at least one opening in one of said covers for injecting live steam therein, said means for injecting live steam comprising a source of steam and a pipe communicating with said source of steam and said first mentioned opening and secondary means in communication with at least one opening in at least one of said covers for withdrawing said steam and entrained smoke, gas, air and air pollutants therefrom, said means for withdrawing said steam and entrained smoke, gas, air and air pollutants comprising a vacuum machine and a pipe communicating with said vacuum machine and with said second mentioned opening, said air pollution preventing means further including pollutant removal means in communicating relation with said air withdrawing means for separating said air pollutants from said steam and air.



4,355,789

GAS PUMP FOR STIRRING MOLTEN METAL

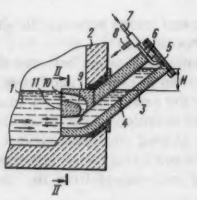
Boris S. Dolzhenkov, ulitsa Aerodromnaya, 87-2; Vladimir F. Andreev, ulitsa Volskaya, 21-6, both of Kuibyshev, and Vitalii A. Pimenov, ulitsa Timiryazeva, 65V-1, Kuibyshevskaya oblast, Syzran, all of U.S.S.R.

PCT No. PCT/SU79/00026, § 371 Date Jan. 15, 1981, § 102(e) Date Jan. 7, 1981, PCT Pub. No. WO80/02586, PCT Pub. Date Nov. 27, 1980

PCT Filed May 15, 1979, Ser. No. 229,579

Int. Cl.³ C22B 9/04; F04F 7/00

U.S. Cl. 266—207 3 Claims



1. A melting furnace including a melting chamber at least partially defined by a side wall and a gas pump for stirring molten metal situated within said melting chamber, said gas pump comprising a refractory-lined pipe with a removable cover formed with an opening adapted to communicate the pipe interior with a compressed gas supply system and with a vacuum system, said pipe extending through said melting chamber side wall in a generally downward direction from an upper portion located outside of said melting chamber to a lower portion located within said melting chamber, said pipe having an inner passage opening at an outlet portion into the interior of said melting chamber, said lower portion of said pipe having a thicker upper wall in which is formed at least one auxiliary duct opening into the interior of said melting chamber at a location above said outlet portion of said pipe inner passage and which communicates with said inner passage of the pipe through an inlet substantially tangential thereto and having its outlet portion directed along the flow of metal at the moment of its expulsion from the inner passage of the pipe.

4,355,790

HEAT-TREATMENT DEVICE FOR PROLONGING THE LIFE OF A PRESSURE VESSEL SUCH AS A REACTOR PRESSURE VESSEL ESPECIALLY

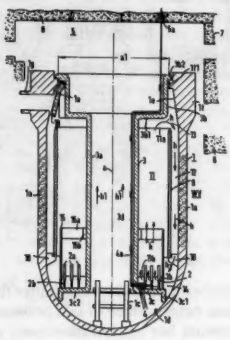
Peter Krauss, Erlangen; Ewald Müller, Neunkirchen; Horst Pörner, Erlangen, and Robert Weber, Uttenreuth, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim (Ruhr), Fed. Rep. of Germany

Filed Nov. 28, 1979, Ser. No. 97,977

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1978, 2851925

Int. Cl.³ C21D 9/00

U.S. Cl. 266—252 6 Claims



1. Heat-treating device for prolonging the life of a pressure vessel formed of thermally resistant material subject to time-dependent structural changes due to neutron fluence comprising an heating device positionable within a pressure vessel adjacent to a wall portion thereof which is to be heat-treated; a mounting support for said heating device including a substantially cylindrical, heat-insulating holding member insertable into and removable from the pressure vessel through an opening in the pressure vessel; supply lines for an energy carrier supplying the heat; insulating means for keeping the heat away from heat-sensitive parts of the pressure vessel which are not to be heat-treated and for reducing heat losses during the heat treatment; a hollow substantially cylindrical thermal shield disposed in the pressure vessel and, with the inner peripheral surface of the pressure vessel, defining an annular gap; and a reactor chamber wherein at least part of the pressure vessel is located, said reactor chamber being otherwise empty during the heat treatment and having ceiling slabs disposed thereon for shielding said reactor chamber from the outside, said holding member being receivable in the pressure vessel in a location whereat it defines, with the inner peripheral surface of said thermal shield, a convection space communicating at upper and lower ends thereof with said annular gap, said heating device comprising a heating source and being secured to said holding member so that, with the heating device received in the pressure vessel, a flow of heating gas is traversible from said heating source through said convection space to an upper deflection space and, from the latter, downwardly through said annular gap to a lower deflection space and, from the latter, back to said heating source, in a closed circuit, the pressure vessel being formed with an annular shoulder at the opening thereof and having a spherical bottom, and said holding member being formed as a hollow member having a first annular flange at an upper end thereof and a second annular flange at a lower end thereof, said annular flanges being sealingly engageable, respectively, with said annular shoulder and the inner peripheral surface of said spherical bottom, a plurality of convection shafts formed by a plurality of prismatic hollow conduction members being distributed about the outer periphery of said holding member and extending parallel to the axis of the pressure vessel.

4,355,791

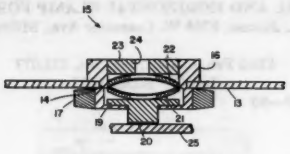
SNUBBER ASSEMBLY

Arthur R. Dean, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 1, 1980, Ser. No. 211,981

Int. Cl.³ F16F 7/00

U.S. Cl. 267—136 10 Claims



1. An apparatus for snubbing a module fitted in the opening of a cabinet comprising:

means mounted in a wall of the cabinet in communication with the opening for providing a housing having a coaxial aperture therein;

means sized to be reciprocally carried in the housing providing means for extending through the coaxial aperture into the opening against the module;

means disposed adjacent the extending means for exerting a snubbing force on the module;

means abutting the exerting means and having a surface mechanically cooperating with the exerting means for selectively fixing the degree of extension of the extending means and magnitude of the snubbing force by the exerting means against the module; and

means interposed between the exerting means and the module for distributing the snubbing force thereon.

4,355,792

HOLLOW MARINE FENDER

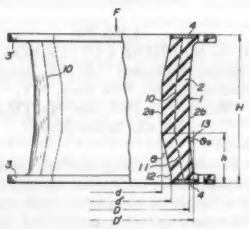
Yuji Fukuda, Yokohama, and Shinichi Kajigaya, Yokosuka, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Nov. 8, 1979, Ser. No. 92,312

Claims priority, application Japan, Nov. 13, 1978, 53-139572

Int. Cl.³ F16F 1/36

U.S. Cl. 267—153 3 Claims



1. In a hollow marine fender comprising a hollow cylindrical body formed of elastic rubber material and adapted to be fitted to a quay wall for the purpose of absorbing the dynamic energy of a ship arising during the berthing thereof by enlarging the diameter of the hollow cylindrical body due to a vertical load subjected to the axial direction of the hollow cylindrical body, at least one end provided with a flange-like mounting portion containing a reinforcing member embedded therein, for mounting said fender to a quay wall the improvement comprising; a portion of a center surface of said hollow cylindrical body which is located at the center part of said hollow cylinder body in its axial direction is made the minimum internal diame-

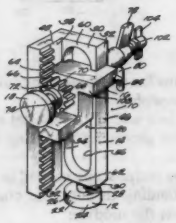
ter said center surface portion having the minimum internal diameter is deformed into a barrel-like bulging shape by enlargement of the diameter due to a berthing load, and having inner surfaces extending from said center surface portion to each end of the fender, said inner surfaces diverging from said portion of minimum internal diameter toward the end of the fender to form a horn-shaped portion.

4,355,793

VERTICAL AND HORIZONTAL CLAMP FOR T-SLOT

Raymond L. Juneau, 8704 W. Lancaster Ave., Milwaukee, Wis. 53225

Filed Feb. 6, 1981, Ser. No. 232,077
Int. Cl.³ B23Q *3/02*
U.S. Cl. 269—93 **7 Claims**



1. A workpiece clamp assembly comprising:

a. a T-slot slide;

b. a vertically disposed track attached to said T-slot slide;

c. a clamp block slidably mounted on said track and having vertical clamping foot means at its lower extremity;

d. means to bias said clamp block toward said T-slot slide;

e. a horizontally disposed aperture extending through said clamp block;

f. a sleeve rotatably disposed within said aperture, said sleeve having first and second ends protruding from the respective ends of said aperture;

g. a rod having a central portion enclosed within said sleeve and first and second ends protruding from the respective ends of said sleeve;

h. a horizontal clamping foot attached to the first end of said rod; and

i. means to advance said rod in said sleeve to advance said horizontal clamping foot horizontally away from said clamp block.

4,355,794

SPREADING MACHINE CUTTER BOX ASSEMBLY

Conrad A. Costigan, Richmond Hill, N.Y., assignor to Spreading Machine Exchange, Inc., New York, N.Y.

Filed Aug. 4, 1980, Ser. No. 175,254
Int. Cl.³ B65H *29/46*
U.S. Cl. 270—31 **13 Claims**

1. A sheet material spreading machine comprising

a carriage mounted for movement along a table surface and carrying a supply of continuous sheet material to be deposited in superimposed layers on said table surface, with a layer deposited in each operative run of said carriage along said table surface,

a cutter box assembly mounted on said carriage and adapted to cut off the layer of sheet material deposited on the table surface at the end of each operative run of said carriage,

and means for guiding and feeding said sheet material from said supply, through said cutter box assembly to the table surface,

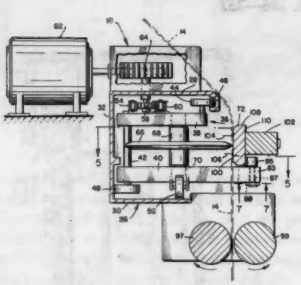
said cutter box assembly comprising an elongated support member mounted on said spreading machine carriage and extending transversely thereof,

a cutter frame movably mounted on said support member,

guide means on said support member for guiding movement of said cutter frame in opposite directions along said support member,

a circular cutter member rotatably mounted on said cutter frame in a horizontal position and having a peripheral cutting edge portion,

a pressure bar movably mounted on said cutter box housing and having a planar inner surface in engagement with the cutting edge portion of said cutter member, and a planar outer surface, said sheet material being fed between said cutter member and the planar inner surface of said pressure bar,



a retaining member mounted on said cutter frame and engaging the planar outer surface of said pressure bar for retaining said pressure bar against movement away from said cutter member, and

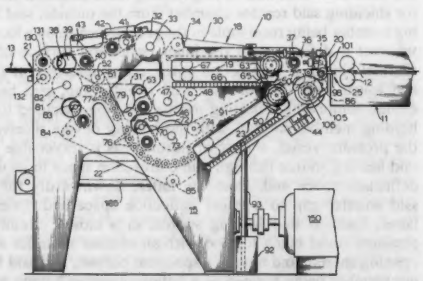
biasing means mounted on said cutter box support member and adapted to urge said pressure bar into firm engagement with said cutter member, thereby causing said cutter member to score sheet materials fed between said cutter member and said pressure bar under rolling action of said cutter member against said pressure bar as said cutter member is carried by said cutter frame and rolls along said support member.

4,355,795

SHEET HANDLING DEVICE

Paul W. Bergland, Montville, N.J., assignor to Bobst Champlain, Inc., Roseland, N.J.

Filed Mar. 4, 1980, Ser. No. 127,142
Int. Cl.³ B65H *39/06*
U.S. Cl. 270—58 **9 Claims**



1. A sheet handling device for receiving a flow of sheets at a given speed of travel from a conveying means at a discharge end of a processing apparatus and discharging the sheets to an input end of a second apparatus, said device comprising a frame with a single input and a single exit; first means mounted in said frame for forming a first path extending between the input and exit; second means mounted in the frame for forming

a separate second path extending between the input and exit, said second path having a curved portion and being longer than said first path by an amount approximately equal to one half of a spacing between leading edges of two successive sheets in said flow of sheets in said processing apparatus, each of said first and second means including a plurality of coacting pairs of continuous ribbon belts extending along substantially the entire length of the respective paths from the input to the exit and means for driving said belts at a new constant speed, which is slower than said given speed; means mounted on the frame at the input for selectively directing sheets into said first and second paths; said first means adjacent the input and the means for directing having means for imparting the new speed of travel to each sheet traveling in the first path; said second means adjacent the input and said means for directing having means for imparting the new speed of travel substantially the same as the speed of travel in said first path to each sheet traveling in the second path, each of said means for imparting including a pair of nip rollers and means for mounting each pair of nip rollers on the frame along the respective path to press the coacting pairs of belts onto the leading edge of a sheet in said path as a sheet is released from the conveying means of the processing apparatus; and each of said first and second paths being arranged to merge at a point adjacent the exit of the frame so that the sheets in each of said first and second paths has reached the new speed prior to being discharged from the path and a sheet in the second path is deposited on a following sheet of the flow traveling in the first path at the point of merging of said paths.

4,355,796

APPARATUS FOR SEPARATING SHEETS FROM A STACK

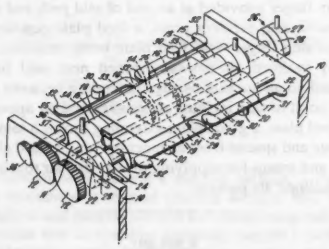
George W. Day, Dovercourt, England, assignor to Vacuumatic Limited, Harwich, England

Filed Jun. 20, 1980, Ser. No. 161,544

Claims priority, application United Kingdom, Jun. 21, 1979, 7921612

Int. Cl.³ B65H *3/30*

U.S. Cl. 271—20 **17 Claims**



1. An apparatus for separating sheets from a stack comprising a pair of parallel contra-rotatable cylindrical rollers for supporting a stack of sheets leaving edge portions on the sides of the stack un-supported, drive means for rotating the rollers in opposite directions such that the top surface of the rollers move away from each other as the rollers rotate, suction inlets located on the surfaces of the rollers adjacent the central regions thereof to act on the central regions of the edges of the lowermost sheet engaging the rollers to draw the central regions of said edge portions of the lowermost sheet downwardly as the suction inlets move outwardly under the lowermost sheet, separator means for penetrating the sides of the stack between the downwardly drawn central regions of the lowermost sheet and the stack above and for passing along the length of the edge portions to the ends of the stack to separate fully the edge portions from the stack above, and means to draw out the lowermost sheet from the bottom of the stack.

4,355,797

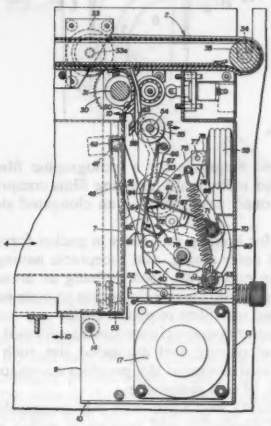
PICKER MECHANISM FOR AUTOMATIC BANKING MACHINES

Harry T. Graef, Dover; Scott A. Mercer, Hanoverton; Jeffrey A. Hill, and Kevin H. Newton, both of North Canton, all of Ohio, assignors to Diebold Incorporated, Canton, Ohio

Filed Oct. 6, 1980, Ser. No. 194,338

Int. Cl.³ B65H *3/08*

U.S. Cl. 271—20 **5 Claims**

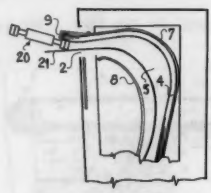


1. Picker mechanism for an ATM note dispenser provided with a supply of notes in a sealed, tamper-indicating note container having an access opening exposing, when uncovered, the end note of the note supply stack of notes in the container, in which the access opening is rectangular in shape and has dimensions one of which is less than the length of the notes in the stack to be picked one at a time through the access opening; including a picker housing; a through picker member having an open cup; means mounting the picker member in the housing with the open cup adjacent said access opening; a bellows mounted in the housing; tube means connecting the bellows and picker member; a bellows plate pivotally mounted on a bellows plate pivot shaft in the housing and connected with the bellows; means movably mounting the picker member on the bellows plate pivot shaft; a cam rotatably mounted in the housing having an endless peripheral actuating surface engageable with each of bellows plate, picker member, and picker member mounting means cam followers; and drive means moving the cam through a picking operation cycle to move the cup multi-directionally into and out of the access opening and also back and forth across the access opening in directions parallel with the length of notes in the stack; said bellows being actuated by and during cam movement to supply suction to the cup; and the picker member mounting means pressing the picker member open cup against an end portion of the end note of the supply stack exposed through said access opening, to suction-and-pressure-engage the cup to said note end portion to peel and extract said end note lengthwise from the stack.

4,355,798
FILM FEED MAGAZINE FOR EQUIPPING A RADIOGRAPHIC FILM CHANGER AND A FILM-CHANGER EQUIPPED WITH SAID MAGAZINE

Francisco Villa, Monza, Italy, assignor to CGR Compania Generale de Radiologia, Monza, Italy

Filed Sep. 4, 1980, Ser. No. 184,056
Claims priority, application France, Sep. 4, 1979, 79 22078
Int. Cl.³ B65H *1/06*
U.S. Cl. 271—21 4 Claims



1. A film feed magazine for a radiographic film changer having means for individually gripping films comprising:

a light-tight outer casing having an elongated slot formed therein;

a receptacle for holding said films in packet form disposed within said outer casing, said receptacle having an inner wall and an outer wall, each defining an arcuate spout-shaped profile, said receptacle having an open end portion for receiving said films in packet form;

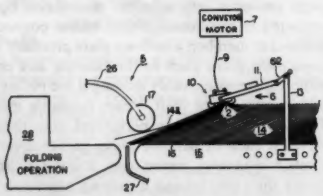
a movable shutter operatively associated with said casing for opening and closing said elongated slot such that said opening of said elongated slot provides access to said open end portion of said receptacle;

means operatively associated with said receptacle and said shutter for displacing said receptacle within said outer casing from a first position wherein said receptacle is remotely disposed within said casing with respect to said elongated slot and said movable shutter closes said elongated slot to a second position wherein said receptacle is proximately disposed within said casing with respect to said elongated slot and said movable shutter opens said elongated slot such that an end portion of said films in packet form passes through said elongated slot for access to said means for gripping said films.

4,355,799
SHEET STREAM SENSING AND CONTROL DEVICE

John J. Bartizal, Jr., 1015 W. 61 St., Lisle, Ill. 60532

Filed May 5, 1980, Ser. No. 146,307
Int. Cl.³ B65H *1/22*
U.S. Cl. 271—151 3 Claims



3. A sheet stream sensing and control device adapted for use in a sheet feed system having a sheet transport for advancing a reclining sheet stream toward a sheet removal means, said sheet stream having a surface discontinuity peak defined where the foremost sheet upper edge joins the upper edges of the subsequent underlapped sheets, comprising:

detector means for detecting the movement of said discontinuity peak beyond a limit point;

first and second support means, resting respectively upon the foremost sheet surface and the upper edges of said subsequent underlapped sheets, for supporting said detector means above the sheet stream surface in such a manner that said detector means is operative to detect the movement of said discontinuity peak between said first and second support means when the peak moves beyond said limit point;

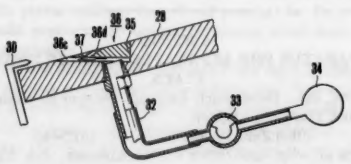
linkage means for constraining said detector means in the horizontal direction of sheet stream flow to thereby establish a sheet stream quiescent operating position with respect to said sheet removal means, said linkage means further including means for allowing said detector means complete freedom of vertical movement;

control means, responsive to said detector means, for controlling the movement of the sheet stream so as to maintain said quiescent operating position.

4,355,800
PAPER FEED CONTROL APPARATUS FOR USE IN SHEET PRINTING PRESSES

Hiroyuki Sugiyama, Toride, Japan, assignor to Komori Printing Machinery Co., Ltd., Tokyo, Japan

Filed Apr. 10, 1981, Ser. No. 253,073
Claims priority, application Japan, Apr. 22, 1980, 55-52323
Int. Cl.³ B65H *9/14*
U.S. Cl. 271—229 4 Claims



1. A paper feed control apparatus for use in a sheet printing press comprising means for sequentially feeding paper sheets to said printing press along a predetermined paper feed path, a front stop finger provided at an end of said path and at a position close to said printing press, a feed plate positioned near said front stop finger, said feed plate being provided with an upwardly inclined air passage opened near said front stop finger, and an air suction passage extending between an intermediate point of said inclined air passage and an upper surface of said feed plate, a guide plate extending through said inclined air passage and spaced from an inner opening of said air suction passage, and means for supplying pressurized air to a lower end of said inclined air passage.

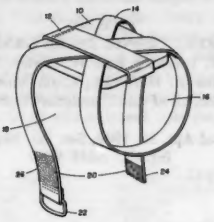
4,355,801
ADJUSTABLE WEIGHT LIFTING HOLDING DEVICE FOR LEG LIFTING EXERCISES

Timothy A. Thomsen, Iowa City, Iowa, assignor to University of Iowa Research Foundation, Iowa City, Iowa

Filed Dec. 9, 1980, Ser. No. 214,484
Int. Cl.³ A63B *21/12*
U.S. Cl. 272—119 3 Claims

1. An adjustable device for holding weights behind the user's ankle when performing leg lifting exercises, said device comprising a pad of sufficient flexibility to conform generally to the dorsum of the user's foot, means on said pad forming a fixed loop, a single continuous strap extending through said loop in one direction and back through said loop in the opposite direction to form an adjustable lower closed loop engageable with the user's foot, the free ends of said strap being closable to form an adjustable upper loop engageable with the user's ankle, fastening means providing for adjustably securing the free ends

of said strap together to close the upper loop, and a ring affixed to one end of said strap to provide for fastening of a weight on



the upper loop, said ring also forming a part of said fastening means for securing the free ends of said strap together.

4,355,802

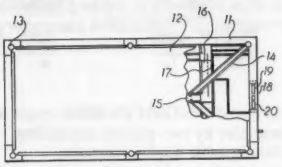
BILLIARD TABLE

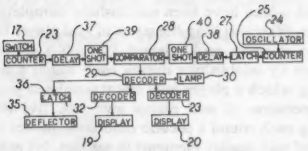
Alfred E. Sargent, Hardin, Mont., assignor to Montana Billiard Supply, Billings, Mont.

Continuation-in-part of Ser. No. 38,675, May 14, 1979, abandoned. This application Mar. 17, 1981, Ser. No. 244,768

Int. Cl.³ A63D *15/20*

U.S. Cl. 273—11 R **9 Claims**





1. A billiard table having a playing surface, a plurality of pockets associated with said playing surface, ball collecting means below said playing surface for transferring balls entering said pockets into a common channel, circuitry including an electrical power source, ball contacting switch means disposed along said common channel, first pulse counting means responsive to pulses from said switch, oscillating means, second pulse counting means responsive to pulses from said oscillating means, latching means associated with said second pulse counting means and responsive to pulses therefrom, digital comparing means receiving signals from said first pulse counting means and from said latching means of said second pulse counting means, decoding means transmitting a pulse from said comparing means and display means capable of receiving said pulses from said decoding means; whereby rapid periodic pulses transmitted from said oscillating means to said second pulse counting means cause signals to be sent therefrom to said latching means at the same rate, so that when a ball passes said switch means, a pulse is transmitted from said switch means to said latching means to lock the signal transmitted to said comparing means, and at the same time a pulse is transmitted from said switch means to said first pulse counting means causing a signal to be transmitted therefrom to said comparing means, and when said signal from said first pulse counting means matches said signal from said latching means, a pulse is transmitted from said comparing means through said decoding means to said display means.

4,355,803

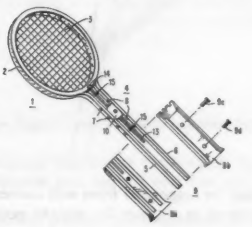
TENNIS RACQUET WITH VARIABLE CENTER OF GRAVITY AND BALANCE

Lord Rama, Rosendale, N.Y., assignor to Coin-Operated Exercise Equipment Co. Inc., Carmel, N.Y.

Filed Dec. 22, 1980, Ser. No. 218,540

Int. Cl.³ A63B *49/00*

U.S. Cl. 273—73 J **3 Claims**



1. A tennis racquet comprised of (a) a head, a handle and a grip, with the handle comprised of two side frames, (b) a weighted mechanism slidably mounted between the two side frames, (c) ball and detent means comprised of a series of correspondingly placed detent holes in the side frames adjacent to the sides of the weighted mechanism and a ball positioned between each side frame and the adjacent side of the weighted mechanism, (d) means for readily maintaining the position of the weighted mechanism at intermediate positions between the head and grip comprised of cam means in which the cam is cross-shaped and is slidably located in a detent box, which in turn is slidably located within the weighted mechanism, said box having a detent hole on each side and said box being spring-loaded longitudinally against the ends of the weighted mechanism, said cross-shaped cam being attached at the intersection of the two arms of said cross to the gripper plates of the weighted mechanism, so that the cam moves in unison with the gripper plates when said weighted mechanism is moved in the direction of the head or grip of the racquet by manually gripping said gripper plates, but the detent box is delayed in moving in said direction, thereby allowing each ball, which at rest was maintained in a detent in the adjacent side frame by the transverse cross-arm of the cross-shaped cam, to recede further into the corresponding detent hole in the detent box as movement brings the longitudinal section of the cross-shaped cam opposite the detent hole of the detent box; and the spring-loading of the detent box bringing the transverse cross-arm of said cross-shaped cam adjacent to each ball thereby forcing each ball into the detent in the side frame adjacent to it and maintaining the weighted mechanism where it is located between head and grip when the manual movement is stopped.

4,355,804

CLUB AND CLUB HOLDER

D. Michael Bingham, 105 West 700 North, Bountiful, Utah 84010

Filed Jul. 13, 1981, Ser. No. 282,877

Int. Cl.³ F41B *15/02*

U.S. Cl. 273—84 R **19 Claims**

1. A club detachably secured to a carrier comprising:

an elongate stick having a shoulder member at the base of a hand grip portion thereof, said hand grip portion being located towards a first end of said stick;

a carrying ring through which said stick may be slidably inserted, said ring having a size and shape that prevents said shoulder member from passing therethrough, said ring being adapted to be flexibly secured to a desired carrier, such as the belt of a user of the stick, whereby said

stick may be suspended from said carrier with said hand grip portion in a generally upright position by slidably inserting a second end of said stick through said ring until said shoulder member engages with said ring; and

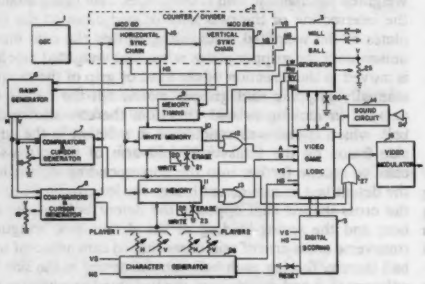
locking means for selectively preventing said stick from being slidably removed from said ring.

4,355,805

MANUALLY PROGRAMMABLE VIDEO GAMING SYSTEM

Ralph H. Baer, Manchester, and Leonard D. Cope, Merrimack, both of N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Sep. 30, 1977, Ser. No. 838,419
Int. Cl.³ A63F 9/22
U.S. Cl. 273—85 G **14 Claims**



7. An interactive game system including game control circuits for generating signals representing location controllable symbols and game background for display on a raster scan type video display, wherein the improvement comprises:

means for displaying a first cursor on said video display that can be moved about to draw lines on said display;

means connected to said cursor displaying means and manually operable to generate a first signal for causing said cursor to be moved about said video display to draw lines thereon, which represent interactive game elements when the drawn lines interact with said location controllable symbols so as to cause a change in what is displayed; and

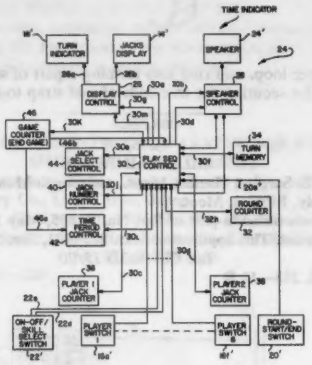
means for combining said first signal with said symbol and game background signals to interact with said location controllable symbols to provide game characteristics.

4,355,806

ELECTRONIC JACKS GAME

Gordon H. Buck, Torrance; Paul W. Cayley, Jr., Rancho Palos Verdes; Martha K. Hardwick, Costa Mesa, and Daniel J. Shoff, Torrance, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Apr. 28, 1980, Ser. No. 144,799
Int. Cl.³ A63F 9/00
U.S. Cl. 273—85 G **10 Claims**



1. A multi-round hand-held electronic game for simulation of Jacks game play by two players comprising:

a set of illuminatable display elements;

a player turn indicator having first and second states;

a plurality of player switches, each player switch being located adjacent to a respective one of said display elements of said set;

control means for imposing upon game play the rules of the game of Jacks by (i) maintaining a count of the number of rounds which have been successfully completed by each player, (ii) controlling the states of said player turn indicator to indicate each players turn, (iii) simulating ball bounce by establishing during each round a time period during which a player may effect simulated jacks pick-up by operation of said player switches, (iv) illuminating during each round a pseudo random sequence of selected ones of said display elements in said set, (v) extinguishing each illuminated display element responsive to operation of the player switch adjacent to that display element during said time period to simulate jack pick up, and (vi) changing the state of said player turn indicator responsive to continued illumination of any one of said selected display elements at the expiration of said time period to thereby end a player's turn when that player is unsuccessful in extinguishing all of the display elements that become illuminated during any round, whereby the winning player is the one to first successfully complete a predetermined number of rounds.

4,355,807

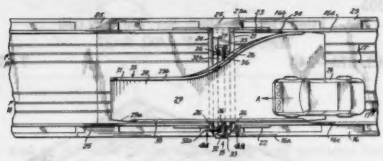
PIVOTABLE RAMP DEVICE FOR TRACK GAMES

Barry V. Prehodka, Ridgefield, Conn., assignor to Aurora Products Canada Limited, Mississauga, Canada

Filed Jan. 23, 1981, Ser. No. 227,865
Int. Cl.³ A63F 9/14; A63H 18/16
U.S. Cl. 273—86 R **16 Claims**

12. A pivotable ramp device for use in a track game having at least one toy vehicle and a track on which said toy vehicle can ride, comprising a base which is selectively coupleable to

a position along said track, said base being formed to define an axis of pivoting extending transversely across said track and spaced above said track a sufficient height to permit the passage of said toy vehicle thereunder, ramp means pivotally coupled to said base at said axis of pivoting, said axis defining two sides of said ramp means, a first of said sides being an entrance side and second of said sides being an exit side, said ramp means being pivotally displaceable between a first position where the end of said entrance side essentially contacts



said track for permitting a toy vehicle to ride up said ramp means and a second position where the end of said exit side essentially contacts the track for permitting said toy vehicle to ride down said ramp means and onto said track, and holding means for releasably holding said ramp means in said second position whereby a vehicle riding in one of said lane passes under said axis and engages the underside of said ramp means to release said holding means to pivot said ramp means to said first position when said ramp means is in said second position.

4,355,808

WEIGHTED, INLAID GOLF IRON AND METHOD OF MAKING SAME

Doyle D. Jernigan, and Margaret Caskey, both of Temple, Tex., assignors to Golf Division, Wood-Arts Company, Inc., Temple, Tex.

Filed Mar. 27, 1981, Ser. No. 248,423
Int. Cl.[3] A63B *53/04;* B29D *3/00*
U.S. Cl. 273—169 6 Claims

1. A method for preparing a decorative inlay in a golf iron comprising the steps of:

a. preparing a cavity in the rear of said iron;

b. positioning a preselected number of small weights only along the inner most bottom edge of the cavity;

c. placing a first epoxy layer in said cavity to substantially cover and secure said weights;

d. adding a decorative epoxy layer to said cavity after said first epoxy layer has set, said decorative epoxy layer substantially filling said cavity and covering said first epoxy layer; and

e. placing a protective coating over said decorative epoxy layer after said decorative layer has set.

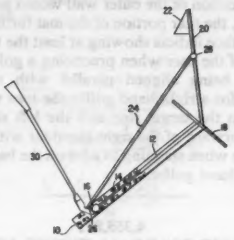
5. A golf iron having an inlay prepared in accordance with claim 1, wherein said inlay is of a swirl pattern.

4,355,809

GOLF CLUB ALIGNER

H. Robert Swett, Jr., 7844 Kenskill Cir., Lantana, Fla. 33462

Filed Aug. 25, 1980, Ser. No. 180,974
Int. Cl.[3] A63B *69/36*
U.S. Cl. 273—183 D 4 Claims



1. A golf club aligner comprising in combination,

a base plate,

a slidable horizontal ball holder mounted on the base plate,

a vertical reference pole located near one end of the base plate,

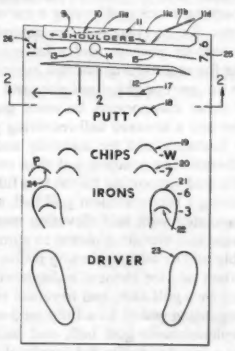
a long rigid slender pointer including means for temporarily attaching one end thereof to the striking face of a golf club so that the other end of the pointer extends towards the vertical reference pole, golf club placement indicia on the base plate spaced to keep one end of the pointer when attached to a golf club being aligned in proximity to the vertical reference pole by compensating for the various angles of loft of different golf clubs.

4,355,810

GOLF CLUB SWING TRAINING DEVICE

Joseph P. Rydeck, 422 Arneill Rd., Camarillo, Calif. 93010

Continuation of Ser. No. 115,175, Jan. 25, 1980, abandoned, which is a continuation of Ser. No. 861,984, Dec. 19, 1977, abandoned. This application Dec. 22, 1980, Ser. No. 219,295
Int. Cl.[3] A63B *69/36*
U.S. Cl. 273—186 C 5 Claims



1. A golf swing practice and training device comprising:

(a) a flat mat having a front edge and adapted to lie horizontally on a supporting surface;

(b) a guideway including an outer wall fixed to and extending upwardly from the mat adjacent the front edge thereof, the outer wall having a straight portion and indicia hereon directing the golfer to align his shoulders with the straight portion of the outer wall;

(c) the mat including a rear portion extending rearwardly of the guideway, the rear portion having indicia on the upper

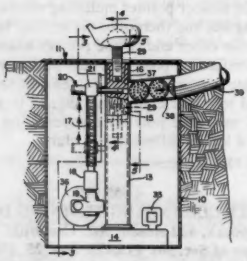
surface thereof adjacent the outer wall representing the proper positioning of a golf ball, the rear portion of the mat further having indicia on the upper surface thereof in the form of a target line which points in the direction of the anticipated target, the axis of the target line and an axis through the straight portion of the outer wall forming an acute angle so that a ball following the direction of the straight portion of the outer wall would pass forwardly of the target, the rear portion of the mat further having on its upper surface indicia showing at least the toe positions for the feet of the user when practicing a golf swing, the toe positions being aligned parallel with the target line, whereby for a right hand golfer the toes will be on a line parallel to the target line and the left shoulder will be slightly forward of the right shoulder with respect to the target line when standing to address the ball and visa versa for a left hand golfer.

4,355,811

AUTOMATIC GOLF BALL TEEING APPARATUS

Louis E. Williams, Sr., P.O. Box 4216, Columbia, S.C. 29240

Filed Aug. 28, 1980, Ser. No. 182,092
Int. Cl.[3] A63B *57/00*
U.S. Cl. 273—201 **1 Claim**



1. In an automatic golf ball teeing apparatus having a tee assembly, including a tee mounting block and a tee element for holding a golf ball, said tee element being pivotally mounted on said tee mounting block and having a curved lower end, a supporting piston for carrying said tee assembly between an elevated fully teed-up position and a lowered ball-receiving position, means for maintaining said tee assembly and its supporting piston in an upright condition and permitting the movement of these components between an elevated fully teed-up position and a lowered ball-receiving position, elevating means for lowering said tee assembly and its supporting piston to a ball-receiving position and then returning said tee assembly and its said supporting piston to a fully teed-up position after receiving a replenishment golf ball, a control system operatively associated with said elevating means and said tee assembly to cause said elevating means to automatically lower said tee assembly and its said supporting piston to a ball receiving position, when said tee element is displaced about its pivot pin when struck by a golf club, and to return said tee assembly and its said supporting piston to a fully teed-up position after receiving a replenishment golf ball, and ball supply means communicating a gravitationally-fed supply of golf balls to said tee element, the improvement wherein the said means for maintaining said tee assembly and its said supporting piston in an upright condition comprises:

a ball guide which is hollow and vertically mounted, provided with

a long, narrow, vertical slot in one side to permit said elevating means to attach to said tee assembly and its said supporting piston and permit the vertical movement of said elevating means with said tee assembly and its said supporting piston as a unit, and

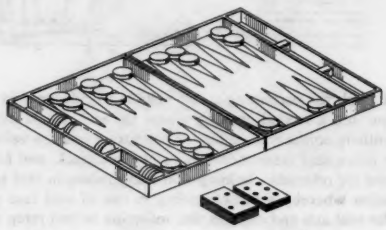
an opening in one side, near its upper end, sufficient in size to permit said curved lower end of said tee element, pivotally mounted above said supporting piston, to protrude through the side of said ball guide when said tee element is displaced about its pivot pin when struck by a golf club.

4,355,812

STACK OF CARDS REPRESENTING DICE AND BACKGAMMON GAME

Robert W. McCullough, 125 Burnett Dr., Spartanburg, S.C. 29303

Filed Oct. 20, 1980, Ser. No. 199,020
Int. Cl.[3] A63F *3/00, 9/00*
U.S. Cl. 273—248 **7 Claims**



5. A duplicate backgammon game comprising:

a playing board, movable playing pieces, and a chance means comprising a stack of cards containing a multiple of three cards for simulating the statistically random sequential occurrences of any and all possible combinations resulting from the roll of two dice, each card of said stack having two opposing faces, a first symbol on one face, a second symbol on the other face, said first symbol representing only one number chosen from the group consisting of the numbers 1 through 6, said second symbol representing only one number chosen from the group consisting of the numbers 1 through 6, each said number occurring the same number of times throughout said stack, said first and second symbols chosen so that the values represented by said first and second symbols have a random relationship, said random sequential occurrences being generated by sequential pairings of two of said symbols, said random relationship of first and second symbols and said equal number of occurrences of each number in said stack insuring that there is a statistical probability larger than zero associated with the event of any pair of numbers occurring more than two times during the simulation of said statistically random sequential occurrences.

4,355,813

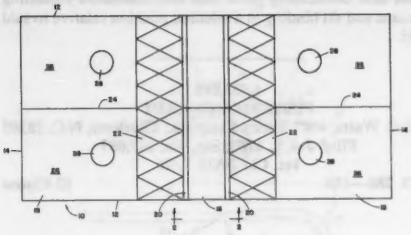
PLAYING FIELD LAYOUT

Daniel J. Rathjen, 5112 N. Fairmount St., Davenport, Iowa 52806

Filed Aug. 10, 1981, Ser. No. 291,707
Int. Cl.[3] A63C *19/02*
U.S. Cl. 273—411 **3 Claims**

1. A playing field layout for use in playing a game involving the throwing back and forth by at least two players of a lightweight saucer-like object of the type commonly known as a "Frisbee", comprising a rectangular main court having opposite sides and opposite ends defining side and end boundaries, respectively, a relatively narrow skip court extending from one side of the main court to the other midway between the ends of the main court and dividing the main court into opposite serving and catching areas of equal area, each of said areas being greater than that of the skip court and each such area accommodating at least one player, said skip court having a flat top surface composed of hard material from which the object can

skip when thrown by a player in one serving and catching area to a player in the other serving and catching area, said skip court further having opposite edge portions parallel to each



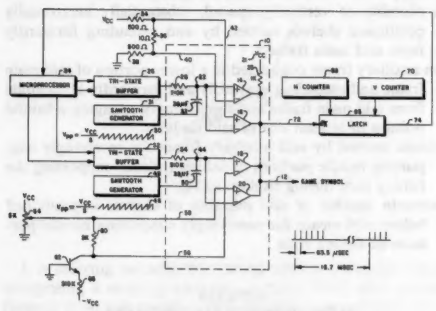
other and to the ends of the main court, said portions being in the form of ramps leading uphill from the respective service and catching areas to the top surface of the skip court.

4,355,814

VIDEO GAME SYMBOL GENERATION AND CONTROL APPARATUS

Leonard D. Cope, Merrimack, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Feb. 22, 1977, Ser. No. 770,740
Int. Cl.³ A63F 9/22
U.S. Cl. 273—85 G **16 Claims**



1. Apparatus for generating a symbol adaptable for display on the screen of a raster scan cathode ray tube display and controllable in at least one direction from multiple sources, comprising:

a first control source providing a first variable control signal for said at least one direction;

a second control source providing a second variable control signal for said at least one direction;

means for providing sweep signals at the deflection rate in said one direction;

means for superimposing said sweep signals on said first control signal;

means for comparing the output of said superimposing means with said second variable control signal and for generating a signal indicative of the point in said one direction on the display screen where the symbol generation is to begin when the output of said superimposing means is greater than the second control signal; and

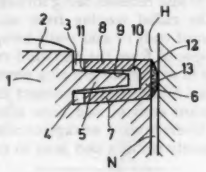
means for generating the symbol.

4,355,815

PISTON RING

Gerhard Dück, Burscheid, Fed. Rep. of Germany, assignor to Goetze AG, Burscheid, Fed. Rep. of Germany

Filed Aug. 6, 1980, Ser. No. 175,851
Claims priority, application Fed. Rep. of Germany, Aug. 21, 1979, 2933702
Int. Cl.³ F16J 9/20
U.S. Cl. 277—143 **4 Claims**



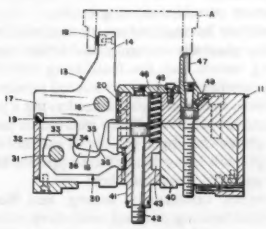
1. In a cross-sectionally U-shaped, radially inwardly open piston ring for a piston slidably received in a cylinder; the piston ring having an axis and including first and second radially inwardly projecting, circumferentially extending legs having outer circumferential ends; said piston ring further including an annular connecting portion joining said legs at said outer circumferential ends; the improvement wherein said legs are, in course and dimensions, symmetrical to one another relative to a central radial plane of the piston ring; said central radial plane extending perpendicularly to said axis of said piston ring; further comprising means defining a circumferential recess in a radially outer circumferential zone of said first leg near said annular connecting portion for rendering said first leg resiliently swingable in a direction parallel to the axis of the piston ring, so that when said piston ring is in place on said piston, with said legs received in respective grooves of the piston while straddling a radially outwardly projecting, circumferentially extending web forming part of the piston, said first leg is circumferentially pressable against said web by pressures prevailing at said high-pressure side.

4,355,816

DOUBLE ACTING INTERNAL DIAMETER GRIPPING CHUCKS

Jay D. Beery, Traverse City, Mich., assignor to Sheffer Collet Company, Traverse City, Mich.

Filed Jun. 30, 1980, Ser. No. 164,784
Int. Cl.³ B23B 5/22, 5/34
U.S. Cl. 279—2 R **1 Claim**



1. A chuck for internally gripping an annular workpiece, said chuck having a main body and a plurality of article gripping jaws arranged in a circle concentric with the axial center of said chuck; each of said jaws being elongated axially of the chuck and having a rearwardly extending arm; first means pivotally mounting each of said jaws intermediate its ends to said body; a plurality of generally radially extending levers, one for each jaw; each of said levers having a recess opening through its forward face; the rearward ends of said arms of said

jaws being received in said recesses; each of said levers at its radial outer end having a forwardly extending leg forming the radial outer ends of the recesses and engaging the radial outer faces of the rearward ends of said arms; second means pivotally mounting each of said levers at a point axially rearwardly and radially outwardly of said arms; actuator means slidably and concentrically seated in said body and engaging the radial inner ends of said levers, said actuator means being movable axially of said body for pivoting said levers and said jaws between workpiece gripping and release positions; the inner radial end of each of said recesses being formed by a forwardly extending wall, the radial spacing from said second pivot means of the forward ends of said walls being such that said forward ends are spaced from the rearward ends of said arms when said jaws are in workpiece gripping position and the arcs of movement of said forward ends intersect the radially inner faces of the rearward ends of said arms after initial pivotal movement of said levers toward workpiece release position has occurred for positively shifting said jaws to release position.

4,355,817

SKI BRAKE

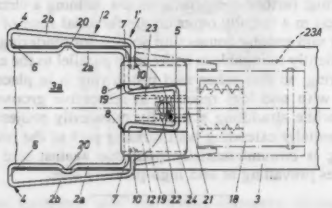
Erwin Krob, Vienna, and Erwin Weigl, Brunn am Gebirge, both of Austria, assignors to TMC Corporation, Baar, Switzerland

Continuation of Ser. No. 786,376, Apr. 11, 1977, abandoned. This application Nov. 12, 1980, Ser. No. 206,102

Claims priority, application Austria, Apr. 16, 1976, 2853/76

Int. Cl.³ A63C 7/10

U.S. Cl. 280—605 **2 Claims**



1. A ski brake for use on a ski to effect a braking of said ski following a release of a ski boot from engagement with a ski binding, said ski binding being supported for movement lengthwise of said ski, comprising:

a base plate mounted on said ski and having an elongated slot therein extending parallel to the longitudinal axis of said ski;

mounting means;

bearing means on said mounting means;

a brake member having axle means received in said bearing means for pivotally securing said brake member to said mounting means and for facilitating movement of said braking member between a retracted position and a braking position, said braking member having a pair of braking wings and a pedal member, said pedal member being located above the upper surface of said ski and said braking wings each being located on opposite lateral sides of said ski and said pedal member;

resilient means continually urging said brake member toward said braking position; and

connecting means for connecting said mounting means to said ski binding to facilitate a simultaneous movement of said mounting means and said ski binding relative to said ski, said connecting means including a connecting piece separate from said mounting means connected to said ski binding and extending parallel to the longitudinal axis of said ski and vertically spaced above and free of engagement with the upper surface of the ski, and a releasable locking member mounted on said connecting piece for connecting said connecting piece to said mounting means and for facilitating an operative connection of said connecting piece to said base plate, said elongated slot in said base plate receiving said releasable locking member therein, means on the walls of said slot operatively connected to said releasable locking member to fixedly maintain said connecting piece and the connected mounting means and ski binding in a selected position relative to said ski.

4,355,818

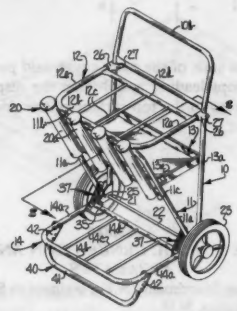
FISHERMAN'S CART

Ronald C. Watts, 4507 Rocky River Rd., Charlotte, N.C. 28205

Filed Jul. 9, 1980, Ser. No. 167,057

Int. Cl.³ B62B 1/26

U.S. Cl. 280—654 **12 Claims**



1. A cart for fisherman's gear comprising

a wheeled main frame adapted to normally occupy and be supported in a substantially upright position,

a plurality of vertically spaced, substantially horizontally positioned shelves carried by and extending forwardly from said main frame,

an auxiliary frame connected to a lower portion of said main frame and extending upwardly and forwardly at an angle from said main frame and supportingly engaging a frontal portion of at least one of said shelves,

means carried by said auxiliary frame for receivingly supporting handle portions of fishing rods for supporting the fishing rods during fishing, and

wherein another of said plurality of shelves is positioned below said means for receivingly supporting handle portions of fishing rods.

4,355,819

PASSIVE RESTRAINT SYSTEM

Claude M. Frisbee, Bettendorf, Iowa, assignor to J.I. Case Company, Racine, Wis.

Filed Dec. 18, 1980, Ser. No. 217,729

Int. Cl.³ B60R 21/10

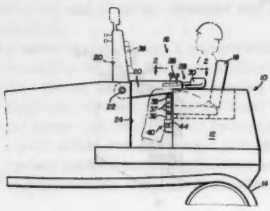
U.S. Cl. 280—752 **6 Claims**

1. A passive restraint system for a tractor having a frame and an operator's seat mounted on said frame, said restraint system including:

a restraint arm having a padded end portion that is contoured to fit against the operator when he is in the operator's seat, said restraint arm connected to mounting means for adjustable movement to accommodate the particular size of the operator, said restraint arm and mounting means being pivotally connected to said frame;

said restraint arm being movable to a generally vertical position where it is out of the way when the operator is getting onto or out of the operator's seat and said restraint arm being movable to a generally horizontal position for engaging the operator to thereby secure him in the operator's seat;

securing means for locking said restraint arm at a selected position for restraining the operator in the operator's seat, said securing means including an adjustable latch link pivotally connected to said mounting means and a latching mechanism mounted to said frame receiving said latch



link for locking engagement to maintain the selected position for said restraint arm; and

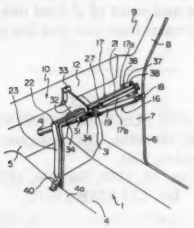
means for making said tractor inoperable until the restraint arm is locked into position for securing the operator in the operator's seat.

4,355,820

STEERING ASSEMBLY SUPPORTING DEVICE OF A MOTOR VEHICLE

Naoto Kitagawa; Kunihiko Masaki, and Hiroyuki Watanabe, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Nov. 25, 1980, Ser. No. 210,307
Claims priority, application Japan, Jun. 12, 1980, 55/78329
Int. Cl.³ B62D 1/18
U.S. Cl. 280—779 **12 Claims**



1. A steering assembly supporting device of a motor vehicle comprising a steering assembly, a floor, front door opening flanges, cowl side panels each extending forward from a front end of the corresponding front door opening flange, front pillars each forming a portion of the corresponding front door opening flange and having a root portion connected to the corresponding cowl side panel, a cowl inner panel spaced from the floor and transversely extending substantially in parallel to the floor at a position above the floor, and a dash panel arranged between the floor and the cowl inner panel, said device comprising:

a hollow tubular L-shaped steering assembly supporting body comprising a leg portion and an integrally formed base portion transversely extending substantially in parallel to the cowl inner panel, said base portion having an inner end, an intermediate portion and an outer end fixed onto the cowl side panel, said leg portion extending downwards from the inner end of said base portion and having a lower end fixed onto the floor midway between said cowl side panels, and;

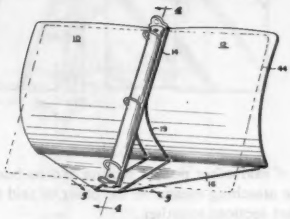
a bracket extending backwards from the cowl inner panel and having a rear end and a front end fixed onto the cowl inner panel, said rear end being connected to the intermediate portion of said base portion, the steering assembly being supported by the intermediate portion of said base portion.

4,355,821

DISPLAY BINDER

Kenneth Z. Crawford, Crawfordsville, Ind., assignor to Crawford Industries, Inc., Crawfordsville, Ind.

Filed Jun. 16, 1980, Ser. No. 159,914
Int. Cl.³ B42D 3/18
U.S. Cl. 281—33 **14 Claims**



1. A display binder, comprising

a cover sheet of sheet material forming front and back cover panels and a spine panel to which the front and back cover panels are hingedly interconnected along their inner edges, and bottom brace panel means hingedly interconnected to the bottom edges of the cover panels,

said cover sheet being of flexibly bendable material of substantially uniform bendability from top to bottom, so that rearward displacement of the bottom edge of the cover sheet with the cover panels in open position causes such sheet to bow rearward in a vertical arc,

a stiff spine bar having loose-leaf binding means for binding leaves thereto,

means connecting the upper portion of the spine bar to the upper portion of the spine panel, the lower portion of the cover sheet being free to be swung rearward away from the lower end of the spine bar to displace the bottom edge of such sheet rearward to form a rear display support for the binder,

the brace panel means being movable between a folded position flat against the inner face of said cover panels to allow opening and closing of the binder as a book and a brace position extending forward from such bottom edges of the cover panels to the spine bar, in which brace position it holds such bottom edges in predetermined outspread relation and in rearward spaced relation from said bar for supporting the open binder as an easel for display of its contents,

and means for connecting the front of the bottom brace panel means to the spine bar in such brace position.

4,355,822

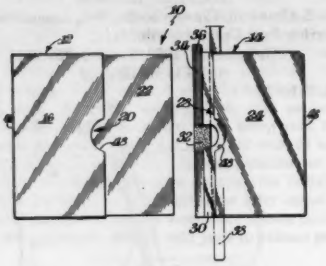
PROTECTIVE BOOK COVER

Edward L. McHugh, 1406 Clive Cir., Wilmington, Del. 19803

Filed Aug. 19, 1980, Ser. No. 179,435
Int. Cl.³ B42D 3/04
U.S. Cl. 281—34 **10 Claims**

1. A removable protective book cover in combination therewith, a book having a front cover and a back cover with the pages therebetween being connected to a binding to which said front and back covers are connected, said removable protective cover comprising a first pocket section and a second pocket section detachably connected to each other for telescopically receiving a respective one of said book covers therein, each of said pocket sections having an inner member and an outer member with their edges connected together along three sides thereof and having its fourth side completely open, each outer member extending outwardly beyond its open side to form a flap, each of said pocket sections being mounted

over its respective book cover with its said inner member juxtaposed said binding of said book, one of said flaps being tucked into the other of said pocket sections between the outer



member of said other pocket section and its book cover, and adjustable attaching means on the other of said flaps securing said pocket sections together.

4,355,823

PRESSURE-SENSITIVE OR HEAT-SENSITIVE RECORDING MATERIAL

Peter Burri, Reinach, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

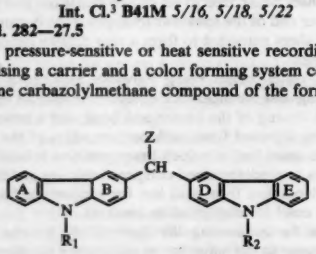
Continuation of Ser. No. 15,979, Feb. 28, 1979, abandoned, which is a continuation of Ser. No. 842,855, Oct. 17, 1977, abandoned. This application Jul. 24, 1980, Ser. No. 171,635

Claims priority, application Luxembourg, Oct. 26, 1976, 76073

Int. Cl.³ B41M *5/16, 5/18, 5/22*

U.S. Cl. 282—27.5 **13 Claims**

1. A pressure-sensitive or heat sensitive recording material comprising a carrier and a color forming system containing at least one carbazolylmethane compound of the formula



(I)

in which each of R_1 and R_2 independently represents hydrogen, alkyl of not more than 12 carbon atoms which is unsubstituted or substituted by halogen, hydroxyl, cyano or lower alkoxy, or alkenyl of not more than 12 carbon atoms, acyl of 1 to 12 carbon atoms, phenyl, benzyl, or phenyl or benzyl which is substituted by halogen, lower alkyl, lower alkoxy or nitro, Z represents alkyl of 1 to 12 carbon atoms, alkenyl of not more than 12 carbon atoms, aryl, aralkyl or represents a unsubstituted or substituted heterocyclic radical selected from the group consisting of 3-carbazolyl, N-benzyl-3-carbazolyl, N-lower alkyl-3-carbazolyl, 2-furyl, 2-thienyl, 4-pyridyl, 2-N-methylpyrrolyl, 3-indolyl, 2-lower alkyl-3-indolyl, 2-phenyl-3-indolyl, 1-acetyl-3-indolyl, 1-lower alkyl-2-methyl-3-indolyl, 1-phenyl-3-methyl-5-pyrazolon-4-yl, 1-phenyl-3-methyl-5-amino-pyrazol-4-yl or 1-methyl-2,4-dioxo-quinolin-3-yl, and each of the rings A, B, D and E independently can be substituted by cyano, nitro, halogen, lower alkyl, lower alkoxy or lower alkylcarbonyl.

4,355,824

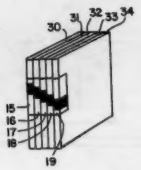
RECORD INDEXING SYSTEM

Joseph Weber, and Maria L. Weber, both of 1105 Massachusetts Ave., Cambridge, Mass. 02139

Filed Jul. 21, 1980, Ser. No. 170,619

Int. Cl.³ B42F *21/00*

U.S. Cl. 283—21 **3 Claims**



1. A record indexing system comprising a substrate sheet having a plurality of uniform size, removable labels adhered on one surface, each label extending along an associated longitudinal axis and including three zones on its top surface, wherein the first of said zones extends from one end of said label along said axis, the second of said zones extends from the other end of said label along said axis and the third of said zones has a predetermined length D along said axis, said first and second zones being characterized by a first optical absorption spectrum and said third zone being characterized by a second optical absorption spectrum,

wherein the third zones of said labels are offset from said one end of said labels by a different distance for each of said labels,

wherein the boundaries between said first and third zones and between said second and third zones are substantially perpendicular to said axes, and

wherein the mid-point of each third zone along said axis is offset from the mid-point of at least one other third zone by a distance greater than zero and less than D along said axis.

4,355,825

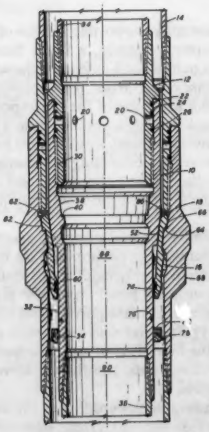
MUDLINE SUSPENSION SYSTEM

Frederick M. Leicht, Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.

Filed Oct. 15, 1980, Ser. No. 197,113

Int. Cl.³ E21B *19/10*

U.S. Cl. 285—3 **8 Claims**



1. A mudline well casing suspension system comprising

a wellhead member having an internal recess with an upwardly facing shoulder at the desired level for landing a casing hanger,

a hanger having an outer downwardly facing tapered landing surface, and

a hollow, generally frusto-conical metallic latching member having an upper end of larger diameter and a lower end of smaller diameter,

said latching member also having a gap permitting circumferential contraction of the latching member, an external, downwardly facing shoulder for engaging said wellhead member shoulder, first slots extending from said upper end to near said lower end, second slots between said first slots extending from said lower end to near said upper end and an internal tapered landing surface to receive and support said hanger landing surface when said shoulders are interengaged,

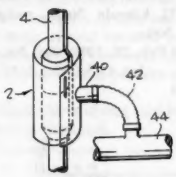
said hanger tapered landing surface engaging said tapered landing surface on said latching member to force said latching member shoulder into full engagement with said wellhead member shoulder and transmitting the weight on said hanger to said latching member, said hanger tapered landing surface in the assembled position being in full engagement with said tapered landing surface on said latching member both above and below said latching member shoulder.

4,355,826

CONTAINMENT SKIRT FOR DRILLING FLUID

Daun W. Von Braun, P.O. Box 498, Spruce Grove, Alberta, Canada

Filed Aug. 6, 1980, Ser. No. 175,893
Int. Cl.³ F16L *55/00*
U.S. Cl. 285—45 **2 Claims**



1. A drilling fluid skirt for well drilling means, and which is wrapped around a drill pipe or well tool connection having upper and lower connecting parts prior to loosening of the connecting parts to contain pressured spray of drilling fluid, mud or water and minimize loss thereof,

the skirt comprising a flexible body portion of length greater than the circumference of the connection about which it is adapted to be wrapped to cover adjacent portions of the connecting parts, and including means for locking the skirt in wrapped contact around the connection,

the outer surface of the skirt adjacent one vertical edge having vertically extending grooves or ribs for mating contact with vertically extending ribs or grooves respectively provided on the inner surface of the skirt adjacent the other vertical edge,

the skirt having handles provided on the outer surface to facilitate positioning, the skirt having an inner surface with bottom portions of the inner surface of the skirt having sealing means for respective contact with the upper and lower connecting parts during wrapping to prevent passage of drilling fluid or mud or water therebetween,

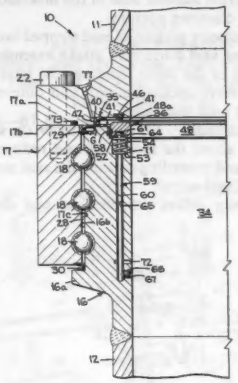
and discharge means comprising a discharge opening with discharge nipple provided centrally in the skirt between the upper and lower sealing means for discharging drilling fluid or mud or water from within the skirt.

4,355,827

PIPE SWIVEL JOINT FOR AMBIENT AND CRYOGENIC TEMPERATURES

Thomas M. Ehret, Malay Le Grande, France, assignor to FMC Corporation, Chicago, Ill.

Filed Nov. 10, 1980, Ser. No. 205,124
Claims priority, application France, Nov. 27, 1979, 79 29183
Int. Cl.³ F16L *17/00*
U.S. Cl. 285—98 **12 Claims**



1. A pipe swivel joint for connecting together a pair of pipes and for transferring fluid between said pipes at ambient and at cryogenic temperatures, said joint comprising:

an annular inner element having an inner surface and an outer surface;

an annular outer element surrounding said inner element said outer element having an inner surface and an outer surface;

an annular bearing race chamber between said inner and outer elements;

bearing means mounted in said race chamber to retain said outer element in surrounding relationship with said inner element and to facilitate relative rotational movement of said elements;

an ambient sealing means in sealing engagement between said inner and outer elements to provide a seal between said elements at ambient temperatures;

means for repositioning said ambient sealing means out of said sealing engagement when the temperature at said junction decreases below a predetermined value; and

a cryogenic sealing means between said inner and said outer elements to provide a seal between said elements at cryogenic temperatures.

4,355,828

UNIVERSAL PLASTIC FLANGE FOR CONNECTING URINALS TO DRAIN PIPES

Raymond F. Taunton, 11541 Holton Rd., Jacksonville, Fla. 32219

Continuation of Ser. No. 726,132, Sep. 27, 1976. This application Jul. 18, 1979, Ser. No. 58,615
Int. Cl.³ F16L *17/00*
U.S. Cl. 285—342 **4 Claims**

1. An outlet joint structure for interconnecting an in-wall drain pipe having a horizontally disposed annular intake extension with a wall hung urinal having an annular outlet port in a wall adjacent surface thereof such that said intake extension and said outlet port are substantially coaxially disposed, and said urinal further including an outwardly bevelled annular boss extending horizontally outward on said wall adjacent surface thereof about the periphery of the mouth of said annu-

lar outlet port in the provision of a flared sealing surface, said joint structure comprising:

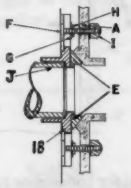
universal flange means interconnecting through said wall, said horizontally disposed intake extension and said outlet port of said urinal, and having an annular body portion defining a stepped bore therethrough;

said stepped bore comprising an enlarged diameter portion adjacent said intake extension and a reduced diameter portion adjacent said outlet port of said urinal in the provision of an internal annular boss in the innermost extent of said enlarged diameter portion;

said enlarged diameter portion of said stepped bore telescopically receiving said horizontal intake extension with the outermost end of the latter abutting said internal annular boss, and adhesive means holding said outermost end in said abutment with said boss;

a horizontally extending, annular shoulder on said annular body portion about the mouth of said reduced diameter bore portion and extending toward the said mouth of said outlet port of said urinal;

an annular sealing gasket mounted on said shoulder and



having a bevelled annular seating surface thereon of a compatible taper, size, and orientation for engaging and sealing with the said flared sealing surface at the mouth of said annular outlet port of said urinal;

said universal flange means further comprising a pair of diametrically opposed mounting ears extending outboard of said annular body portion over the urinal adjacent plane of said wall on which the said urinal is hung;

each of said ears including radially extending slots in the provision of a bifurcated channel defining an elongated bolt head receiving recess between a said ear and the said urinal adjacent plane of said wall;

said urinal having diametrically disposed mounting ports external to said annular boss in said wall adjacent surface thereof;

bolt means having heads slidably mounted in said bolt head receiving recesses of said mounting ears and thereby positioned in registry with and extending through said mounting ports in said urinal; and

means engaging said bolt means to draw said annular sealing gasket into a full sealing engagement with said flared sealing surface and said flange means.

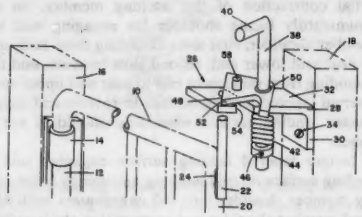
4,355,829

GATE LATCH

James E. Gregory, R.R. #1, Box 130, Fort Madison, Iowa 52627

Filed Dec. 29, 1980, Ser. No. 220,861
Int. Cl.³ E05C 5/02
U.S. Cl. 292—68 **6 Claims**

1. A latch for releasably locking a vertically hinged gate in closed position relative to a fixed support toward and away from which the unhinged edge of the gate swings respectively between closed and open positions, comprising: a base member having means for the rigid affixation thereof to the support and including a horizontal ledge projecting from the support toward the unhinged edge of the gate when in its closed position, said ledge having a vertical opening therein, an upright pivot member carried by the ledge via said opening for both angular and vertical movement relative to the ledge about a vertical axis, means cooperative between the member and ledge for biasing the member normally downwardly, a horizontal plate overlying the ledge and affixed to the member for movement with the member between angularly spaced apart latching and unlatching positions, said plate having a slot leading in from one edge thereof, said slot, in the unlatching position of the plate, opening toward the path of swinging of the gate toward its closed position and, in the latching position of the plate lying crosswise of said path, pintle means on the unhinged edge of the gate for entering the plate slot during



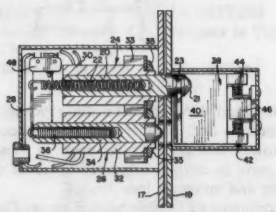
closing of the gate when the plate is in its unlatching position and for retention in the slot when the plate is turned by the force of the closing gate to its latching position, retainer means engageable between the plate and ledge when the plate is in its latching position and disengageable from the ledge when the plate is lifted against the force of the biasing means and turned to its unlatching position, and handle means on the pivot member for manually raising and turning the plate to its unlatching position whereby the plate slot may release the pintle means.

4,355,830

ELECTRICAL LOCKING MECHANISM

David M. Rau, III, Lincoln, Nebr., assignor to CNI Incorporated, Lincoln, Nebr.

Filed Feb. 25, 1980, Ser. No. 124,525
Int. Cl.³ E05C 1/14
U.S. Cl. 292—144 **12 Claims**



1. An electrically actuated mechanism for loading a door or other passage-closing structure in the closed position relative to a stationary member, comprising:

a lock bolt reciprocally mounted on one of said passage-closing structure or said stationary member and movable between a retracted, non-locking position and an extended, locking position;

biasing means mounted on said one passage-closing structure or said stationary member for mechanically urging said lock bolt toward said retracted position;

actuating means mounted on said one passage-closing structure or said stationary member and responsive to a momentary electrical signal for moving said lock bolt in opposition to said biasing means from said retracted position to said extended position;

mechanical latch means mounted on the other of said passage-closing structure or said stationary member for retaining said lock bolt in said extended position notwith-

standing cessation of said momentary electrical signal to said actuating means; and

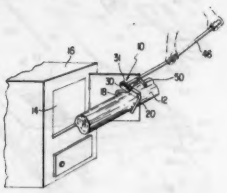
release means mounted on said one passage-closing structure or said stationary member and responsive to a momentary electrical signal for mechanically displacing said latch means and disengaging said latch means from said lock bolt to permit said biasing means to move said lock bolt from said extended position to said retracted position independently of any said electrical signals.

4,355,831

LOADING DEVICE FOR FIREWOOD

Jack B. Smith, Rte. 1, Box 297-A, Whitwell, Tenn. 37397

Filed Jan. 9, 1981, Ser. No. 223,825
Int. Cl.³ A47J *49/00*
U.S. Cl. 294—11 **5 Claims**



1. A loading device for logs and the like comprising:

(a) a pair of opposed arms each having a vertical portion and a horizontal portion, said vertical portion having one or more inwardly extending dogs for gripping said logs and said horizontal portion of each arm being joined at a point for pivotal movement therebetween;

(b) a handle secured transverse to said horizontal portion of one of said arms a distance offset from said point of pivotal movement whereby rotation of said handle in one direction causes said dogs of said vertical portion to engage said log and rotation of said handle in the other direction causes said dogs of said vertical portion to release said log; and

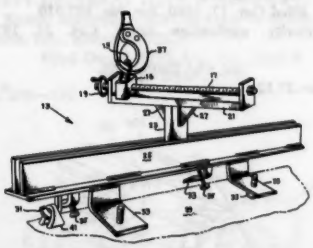
(c) means on said handle for aligning said log relative to said opposed arms during transport.

4,355,832

LOAD BALANCER FOR MULTIPLE LOADS

Roger E. Andersen, Ft. Walton Beach, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 4, 1980, Ser. No. 212,955
Int. Cl.³ B66C *1/10*
U.S. Cl. 294—81 R **2 Claims**



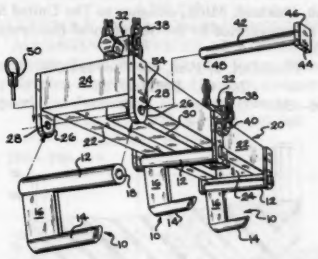
1. A load balancer for hoisting and conveying multiple loads comprising, an elongated rotatable horizontally oriented jack screw, said jack screw being fully threaded, a block laterally movable along the entire length of said jack screw in response to rotation thereof, a load rail for guiding the movement of said block along said jack screw, a lifting eye attached to the upper surface of said block for engagement with a hoisting hook, an elongated beam attached to and spaced below said load rail, said beam being oriented perpendicular to said load rail, and means on said beam for attaching a holding fixture thereto, said holding fixture capable of supporting said multiple loads, whereby any asymmetry of the load on the holding fixture can be balanced by laterally adjusting the position of said lifting eye on said jack screw.

4,355,833

LIFTING APPARATUS

Glenn G. Dunbar, 2608 Overbrook, Toledo, Ohio 43614

Filed Jun. 23, 1980, Ser. No. 162,148
Int. Cl.³ B66C *1/10*
U.S. Cl. 294—87 R **7 Claims**



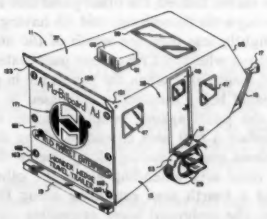
1. Apparatus for lifting a load comprising: a support frame having a pair of laterally disposed side members, said side members being spaced apart in opposed relationship and substantially parallel, said support frame further including at least two flanges extending from said frame, said flanges being in opposed relationship, at least one lifting hook pivotally attached to said support frame for engaging said load, each of said lifting hooks including a generally U-shaped member having a first leg and an opposed second leg, said second leg being fixed to said first leg by a spacing member, said first leg of said U-shaped member being pivotally positioned between said opposed flanges, a lifting bar pivotally connected to said support frame; and means for lifting said lifting apparatus, said lifting means being connected to said lifting bar whereby said lifting bar can pivot with respect to said frame to balance said load.

4,355,834

WEDGE-SHAPED CAMPING TRAVEL TRAILER

Thomas E. Alford, 801 Redwater Rd., Texarkana, Tex. 75501

Filed Aug. 11, 1980, Ser. No. 177,274
Int. Cl.³ B62D *37/02*
U.S. Cl. 296—15 **1 Claim**



1. A trailer comprising a wheeled frame having a front end and a back end, a body having a roof and sidewalls mounted on

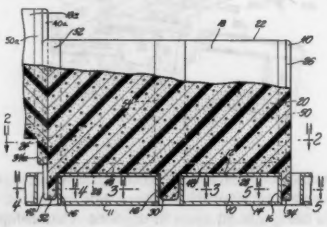
the frame, said body and frame being wedge-shaped and said body having an increasing width and increasing height from the front end to the back end of said frame, and means at the front end of said frame for attaching the trailer hitch of a vehicle, said trailer including an awning mounted on a roller housed at the rear of the roof of the body and extendable therefrom to provide shelter over an area to the rear of the trailer, said body having an aerodynamic spoiler extending across the rear edge of the roof and having a hinged flap portion which can be opened to give access to a storage compartment, wherein said roller and awning are housed in said storage compartment.

4,355,835

LIGHTWEIGHT ONE PIECE SIDE RACK WITH STAKES FOR FLATBED SEMITRAILERS

Earl M. Ash, Oakland, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 6, 1980, Ser. No. 194,646
Int. Cl.³ B62D *27/06*
U.S. Cl. 296—36 **2 Claims**



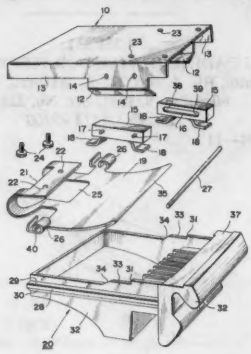
1. A panel adapted for positionment in an upright attitude along the perimeter of a flatbed truck or trailer: said upright panel including a rectangular section defining an upper edge, lower edge, and two side edges; three legs projecting downwardly from the lower edge of the panel rectangular section for positionment in pockets located on the aforementioned flatbed; a first one of the legs being located on the vertical centerline of the panel, a second one of the legs being located at one of the panel side edges, and a third one of the legs being located at the other panel side edge; the first leg having a width in the plane of the panel approximately the same as the corresponding dimension of the mating pocket; each of the second and third legs having a width in the plane of the panel approximately one half the corresponding dimension of the mating pocket, whereby legs on adjacent panels cooperatively occupy selected ones of the pockets; the rectangular panel section and downwardly-projecting legs being integrally formed as a unitary high density plastic foam molded element; one of the panel side edges and associated leg having a vertical groove therealong for receiving an edge area of an adjacent panel when the panels are in place on the flatbed; the other panel side edge and associated leg having a rib therealong, said rib having a transverse thickness slightly less than the width of the aforementioned vertical groove whereby a rib on one panel extends into a groove on an adjacent panel when the panels are in place on the flatbed; the panel being outwardly embossed in selected areas to rigidify the panel against bending forces; said embossed areas including a first area extending along the panel lower edge, a second area extending along one of the panel vertical edges, a third area extending along the other panel vertical edge, and a fourth area extending along the panel vertical centerline; the embossed areas projecting outwardly from both major faces of the panel; the aforementioned legs being continguous to the embossed areas of the panel so that the legs and embossed areas have the same transverse thickness.

4,355,836

ASH TRAY ASSEMBLY FOR AN AUTOMOBILE

Mitsuru Iizuka, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Feb. 1, 1980, Ser. No. 117,639
Claims priority, application Japan, Mar. 1, 1979, 54-24842[U]
Int. Cl.³ B60N *3/12*
U.S. Cl. 296—37.9 **3 Claims**



1. An ash tray assembly adapted for mounting on the instrument panel of an automotive vehicle, comprising:

(a) a cover plate having its one end portion secured on the upper edge of an opening formed in the instrument panel and extending inwardly of the instrument panel;

(b) a resilient protecting plate having an inner portion secured on the lower surface of the cover plate, an outer portion outwardly and upwardly extending through the instrument panel opening to cover the instrument panel, and a turned portion between the inner and outer portions, the protecting plate outer portion having a cam member extending therefrom; and

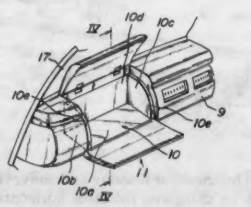
(c) an ash tray supported by the cover plate for sliding movement along the lower surface of the cover plate into and out of the instrument panel opening, the ash tray having a cam surface for engagement with the protecting plate cam member to push the protecting plate outer portion inwardly with inward movement of the ash tray.

4,355,837

GLOVE COMPARTMENT

Kenzo Shimizu, Yokosuka; Yukio Fukunaga, and Hiroshi Tsuda, both of Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 17, 1980, Ser. No. 197,910
Claims priority, application Japan, Oct. 24, 1979, 54-146223[U]
Int. Cl.³ B60R *7/06*
U.S. Cl. 296—37.12 **4 Claims**



1. A glove compartment in an instrument pannel of an automotive vehicle, comprising: a bottom plate having a front portion and a rear portion when looking forwardly, and lid

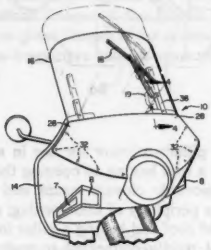
means including a first lid pivotally connected to said compartment adjacent said rear portion, and a second lid pivotally connected to said compartment adjacent to but spaced upwardly above said front portion, said first lid having an essentially planar inner surface, said first and second lids each being pivotable into closed positions in which they close said compartment, and into open positions in which said first lid forms a flush, abutting extension of said bottom plate and said second lid provides access to said compartment from above.

4,355,838

MOTORCYCLE FAIRING

John S. Hickman, 4149 N. Stowell Ave., Milwaukee, Wis. 53211

Filed May 9, 1980, Ser. No. 148,420
Int. Cl.³ B62J *17/04*
U.S. Cl. 296—78.1 7 Claims



1. A translatably adjustable windscreen assembly adapted for use with a motorcycle fairing, said windscreen assembly comprising:

a generally vertical, transparent member which is adapted to be adjacent to the fairing;

means for releasably fastening the windscreen and adjustably positioning the windscreen by translating the entire windscreen up and down relative to the fairing; and,

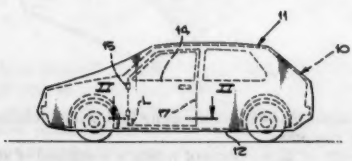
a windscreen wiper assembly, including an electrical wiper motor means, wiper arm and blade, and electrical connecting means between said wiper motor and the electrical system of a motor vehicle, said assembly being mounted directly on said adjustable windscreen and including means for allowing said motor assembly to be movable with said windscreen whereby said wiper motor assembly can be raised or lowered with the adjustable windscreen.

4,355,839

THEFT DETERENT DEVICE FOR CAR COVERS

Jack S. Rosen, Riverside, Calif., assignor to Reliable Auto Accessories, Inc., Riverside, Calif.

Filed Dec. 9, 1980, Ser. No. 214,518
Int. Cl.³ B60J *11/00*
U.S. Cl. 296—136 1 Claim



1. Deterent means for unwanted removal of a vehicle cover having cover material with an internal surface extending over the entire vehicle body and below vehicle closure members such as door, windows, hoods, of a vehicle, comprising, in combination:

an elongated thin band of high tensile strength material;

one end of said band being secured to the internal surface of the cover material at a location which will be adjacent to a joint line between a closure member and the vehicle body and immediately nondiscernible at the outer surface of the cover material;

the band having a length adapted to extend between thwe adjacent vehicle closure member and the vehicle body to position the other band end within the vehicle body;

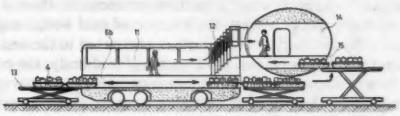
and an enlarged object of rigid nondeformble material secured to said other band end to restrain unwanted separation of the localized areas of the cover material from the vehicle body.

4,355,840

CLOSED VEHICLE AND A COMPLEX EQUIPMENT FOR MANAGING SERVICES AT AIRPORTS

Valer Szendrödi; Gyula Radics; Tivadar Varga; Tibor Vass, and Karoly Gyurics, all of Budapest, Hungary, assignors to Ikarus Karosszeria- es Jarmugyar, Budapest, Hungary

Filed Dec. 27, 1979, Ser. No. 107,660
Int. Cl.³ B64F *1/31*
U.S. Cl. 296—179 8 Claims



1. A system for processing passengers and luggage at an airport, comprising:

means defining a passenger and luggage processing chamber wherein passenger tickets of respective passengers can be examined and checked and luggage assigned to each passenger can be checked in;

a waiting room connected to said chamber and adapted to accommodate passengers processed in said chamber;

luggage-displacing means extending below said waiting room and connected with said chamber for advancing luggage from said chamber along a path substantially parallel to the path traveled by passengers from said chamber to said waiting room; and

an elongated bus-type vehicle alignable with said waiting room and formed with an elongated vehicle body having wheels and defining a passenger space above and separated from a luggage space, said passenger and luggage spaces both extending longitudinally along said vehicle, whereby passengers advancing onto said vehicle and into said passenger space are parallelled by movement of luggage from beneath said waiting room onto said vehicle and into said luggage space, said body being formed with an elevatable stairway at one end of said passenger space for communication with an aperture in an aircraft.

4,355,841

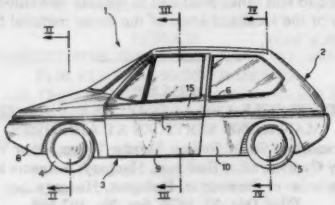
MOTOR VEHICLE BODY

Vittorio Ghidella, and Felice Cornacchia, both of Turin, Italy, assignors to Fiat Auto S.p.A., Turin, Italy

Filed Dec. 31, 1979, Ser. No. 108,627
Claims priority, application Italy, Feb. 2, 1979, 67230 A/79
Int. Cl.³ B62D *27/00*
U.S. Cl. 296—185 2 Claims

1. A motor vehicle having front and rear wheels and a body including side walls each having windows and at least one door, the lower edges of said windows defining a substantially horizontal belt line, each of said side walls below said belt line being comprised of an internal sheet metal wall and an external wall spaced from each other, said body having horizontal line

defining means extending about said body on the external surface thereof immediately above said wheels and spaced below said belt line, the external wall of each side wall between said belt line and said line defining means being comprised of sheet metal and the external wall of each side wall below said line defining means being constructed solely from plastic material parts, wherein considered in a vertical plane containing the axes of the vehicle front wheels, each said first plastic material part has a cross-sectional profile which arches like a roof over the corresponding front wheel and comprises a horizontal



central portion, a vertical flange extending upwards from said central portion and serving to facilitate the secural of said first plastic material part to said metal structure of said body, a downwardly-inclined, straight portion connected to the end of said central portion nearest the interior of said body, and a downwardly-inclined, curved portion connected to the end of said central portion nearest the exterior of said body, the concave face of said curved portion facing upwards and outwards and said curved portion constituting a part of the external lateral wall of the vehicle body.

4,355,842

KICKING PLATE MOUNTING STRUCTURE

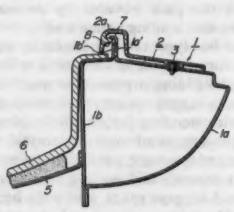
Kazumi Hira, Fujisawa, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 24, 1980, Ser. No. 190,379

Claims priority, application Japan, Sep. 25, 1979, 54-132843[U]

Int. Cl.³ B60R *3/00*

U.S. Cl. 296—199 **6 Claims**



1. In a structure for mounting a kicking plate onto a vehicle body panel forming the side sill at the lower edge of a door opening, said vehicle body panel including outer and inner sill members which are welded to each other at upwardly projecting flanges, said kicking plate including an outer end portion which covers the substantially horizontal upper surface of the outer sill member and which is secured thereto by a first mounting means, and an inner end portion formed substantially as an inverted U-shaped cover which covers said flanges of the sill members and which is secured thereto by a second mounting means, the improvement wherein said second mounting means comprises a first projection formed integrally with at least one of the flanges and protruding generally horizontally toward the inner surface of the cover, and a second projection formed on the inner surface of the cover such that the second projection resiliently engages with the lower surface of the first projection.

4,355,843

PILLAR CONSTRUCTION FOR MOTOR VEHICLE

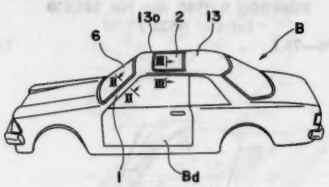
Tetsuro Murakami, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Oct. 6, 1980, Ser. No. 194,279

Claims priority, application Japan, Oct. 16, 1979, 54/143430[U]

Int. Cl.³ B60J *7/02*

U.S. Cl. 296—201 **5 Claims**



1. A roof and pillar structure for use in a motor vehicle which comprises: a roof having an opening therein adapted to be closed by a movable closure means and having a drain trough around the periphery of said opening; a pillar attached to a corner of said roof and having a pillar inner panel and a pillar outer panel rigidly connected to each other so as to define a closed cross section therebetween, said pillar inner panel being formed with a portion of arcuate cross section extending along the entire length of said pillar inner panel and protruding toward the interior of the motor vehicle; a reinforcing pipe member welded along the inner surface of said arcuate cross section portion for fixing said pipe member to the interior of said closed cross section defined by said pillar inner panel and pillar outer panel for reinforcement of said pillar; and a drain pipe extending through the interior of said pipe member and communicated with said drain trough.

4,355,844

SKELETAL LOAD-BEARING STRUCTURES FOR MOTOR VEHICLES

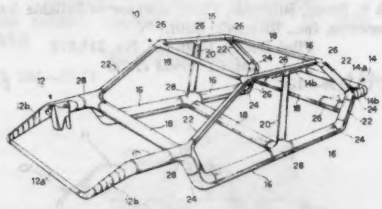
Marco Fantini Muzzarelli, Florence, Italy, assignor to Fiat Auto S.p.A., Turin, Italy

Filed Feb. 28, 1980, Ser. No. 125,388

Claims priority, application Italy, May 25, 1979, 68124 A/79

Int. Cl.³ B62D *21/02*

U.S. Cl. 296—205 **8 Claims**



1. A skeletal load-bearing structure for a motor vehicle, said structure comprising:

a plurality of girders each of which is comprised of at least two shell elements of thin sheet metal provided with longitudinal flanges, said shell elements being joined together by their flange so as to form a tube having a substantially circular profile, and

a plurality of connectors joining the ends of at least two of

said girders together into a unified structure, each said connector comprising at least two shell elements of thin sheet metal having a curved cross-sectional configuration and provided with respective flanges extending uninterruptedly along the longitudinal edges thereof, the said shell elements being connected together by the joining of the flanges along their extent and each said connector shell element having a plurality of arm portions which together with corresponding portions of the other shell elements of the same connector form a plurality of tubular connection stubs to which said ends of said girders are rigidly fixed; said arm portions of each connector shell element merging smoothly with each other across substantially their entire width with the ends of said connector shell elements being provided with rebated extensions coextensive only with the curved portions of said shell elements so as to permit the ends of said girder shell elements to be connected together by overlapping joints and the longitudinal flanges of the girders extending on the prolongation of the flanges of the connector shell elements forming the respective tubular connection stubs of said connectors.

4,355,845

ROOF FOR VEHICLES, ESPECIALLY MOTOR VEHICLES, FOR AGRICULTURAL PURPOSES

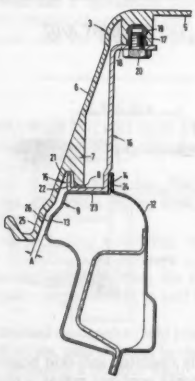
Hermann Ziegler, Renningen, and Eugen Kolb, Stuttgart, both of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Apr. 11, 1980, Ser. No. 139,547

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1979, 2916013

Int. Cl.³ B60J *7/00*

U.S. Cl. 296—210 **11 Claims**



1. Roof assembly for vehicles, especially motor vehicles for agricultural purposes, comprising an inverted trough-shaped roof, having an upper roof wall delimited by an upright roof segment, releasably secured on a vehicle, said upright roof segment having a thickened portion being supported on a roof frame with a sealing means interposed between the portion and roof frame, wherein a supporting part is provided which extends from the upper roof wall to the roof frame and wherein a holding device is provided between the thickened portion and the roof frame in a manner laterally aligning said roof.

4,355,846

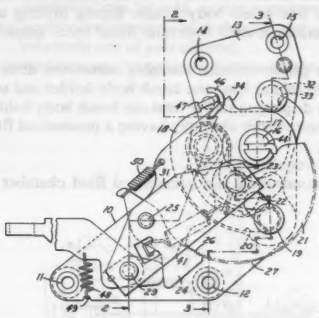
SEAT BACK ADJUSTER

Bernd A. Kluting, Radevormwald, Fed. Rep. of Germany, and Vikram H. Zaveri, Springfield, Mich., assignors to Keiper U.S.A., Inc., Battle Creek, Mich.

Filed Sep. 4, 1979, Ser. No. 72,013

Int. Cl.³ A47C *1/026*

U.S. Cl. 297—366 **16 Claims**



1. A fine increment seat back adjuster for vehicle seats having a tiltable backrest member comprising a first hinge member connectable to a seat rest member, a second hinge member connectable to a backrest member, a first pivot means connecting said hinge members for relative pivoting movement, an intermediate plate pivotally mounted on said first pivot means capable of relative pivotal movement to both said first and second hinge members, a ratchet plate having a circular arcuate toothed sector, a second pivot means spaced from said first pivot means connecting said ratchet plate and first hinge member, a differential translation drive connection between said intermediate and ratchet plates spaced relatively more from said first and relatively less from said second pivot means so as to provide an amplified angular displacement of said ratchet plate about said second pivot means for any corresponding angular displacement of said intermediate plate and second hinge member about said first pivot means, manually releasable toothed pawl means mounted on said first hinge member for engagement and retention of said toothed sector in any adjusted angular position of said ratchet plate relative to said first hinge member, means for limiting backward movement of said second hinge member relative to said intermediate plate reflecting the adjusted position of said ratchet plate, said last means accommodating forward tilting movement of said backrest member without pivotal movement of said ratchet and intermediate plates, stop means for limiting the extremities of movement of said ratchet plate relative to said pawl, and means for positively preventing overtravel of said ratchet plate to a position limited by said stop means where pawl engagement cannot produce full tooth engagement.

4,355,847

APPARATUS FOR HOLDING AND DISPLAYING BRUSH BODIES

Emil Schnekenburger, and Rudolf Schnekenburger, both of Zell, Fed. Rep. of Germany, assignors to Coronet Werke Heinrich Schlerf GmbH, Wald-Michelbach, Fed. Rep. of Germany

Continuation of Ser. No. 83,062, Oct. 9, 1979, abandoned, which is a continuation of Ser. No. 877,250, Feb. 13, 1978, abandoned. This application Nov. 18, 1980, Ser. No. 207,869

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1977, 2747855

Int. Cl.³ B25B *11/02*; A46D *3/00*

U.S. Cl. 300—11 **9 Claims**

1. A spatial positioning and index mechanism for brush body

holders in brush manufacturing machines which perform drilling and stuffing operations comprising, in combination:

a frame;

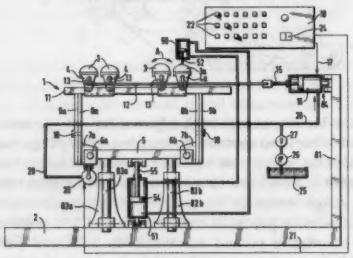
at least one brush body holder, which is movably disposed on said frame for displacement in various predetermined directions and distances;

at least first and second hydraulic linear force amplifiers for displacing said at least one brush body holder in two perpendicular directions and for hydraulically arresting the at least one brush body holder during drilling and stuffing operations, each hydraulic linear force amplifier including

a hydraulic piston-cylinder assembly connected directly directly to said at least one brush body holder and said frame for displacing said at least one brush body holder, said piston-cylinder assembly having a pressurized fluid chamber,

a hydraulic regulating valve,

means for connecting said pressurized fluid chamber of



said piston-cylinder assembly with said hydraulic regulating valve, and

a controlling means having a coupling means connected to said hydraulic regulating valve, said controlling means being responsive to electrical control signals for determining the displacement of said piston in said piston-cylinder assembly,

said means for connecting said hydraulic control valve and said hydraulic piston-cylinder assembly being arranged in combination with said controlling means, said hydraulic regulating valve and said hydraulic piston-cylinder assembly to form a closed control loop in which displacement of said hydraulic linear force amplifier are determined by said controlling means; and

a programmable electronic logic control system having a non-mechanical memory for supplying to the controlling means of the at least two hydraulic linear force amplifiers respective electrical control signals corresponding to stored data in said memory representing predetermined brush body displacements.

4,355,848

WHEEL COVER FOR A VEHICLE

Takao Ookubo, Yokohama; Yuko Baba, Tokyo, and Kiyoshi Kamihama, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd. and Hashimoto Forming Kogyo Co., Ltd., both of Yokohama, Japan

Filed Jun. 3, 1980, Ser. No. 155,924

Claims priority, application Japan, Jun. 4, 1979, 54/68842

Int. Cl.³ B60B *7/00*

U.S. Cl. 301—37 SS **2 Claims**

1. A wheel cover for a vehicle road wheel, comprising: an annular radially outer peripheral portion, a radially inner peripheral portion having a circular outer contour, a plurality of spoke portions located between and connected to the outer and inner peripheral portions, said outer and inner peripheral portions and said spoke portions being integrally formed into a one-piece structure, and means for attaching the one-piece structure cover to the road wheel, each spoke portion being formed by two spoke-resembling members which cross each other at a cross point between said outer and inner peripheral portions, with each member having a front section on an outer surface side and a rear section on an inner surface side, the width of the front section being greater than the width of the rear section, said two spoke-resembling members being stag-

gered at the cross point in axial direction of the wheel cover, with the front section of the spoke-resembling member lying in front at said cross point being thicker that its rear section, and the rear section of the spoke-resembling member lying behind at said cross point being thinner than its rear section, boundary lines between said front and rear sections of the both spoke-resembling members being in a common plane.

4,355,849

HYDRAULICALLY OPERATED ANTI-SKID BRAKING SYSTEMS FOR VEHICLES

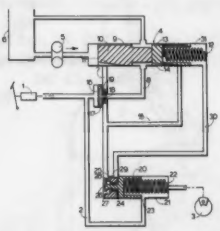
Alexander J. Wilson, Sutton Coldfield, England, assignor to Lucas Industries Limited, Birmingham, England

Continuation of Ser. No. 119,190, Feb. 6, 1980, abandoned. This application Mar. 6, 1981, Ser. No. 241,233

Claims priority, application United Kingdom, Feb. 6, 1979, 7904114

Int. Cl.³ B60T *8/02*

U.S. Cl. 303—116 **9 Claims**



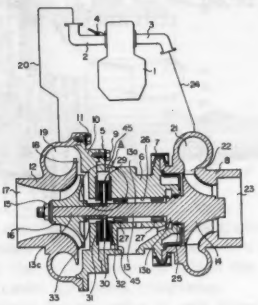
1. An hydraulically operated anti-skid braking system for a vehicle comprising brake applying means, a reservoir comprising a container for hydraulic fluid, an hydraulic pump rotatable with rotation of said wheel and having an input connected to said reservoir and an output connected to said brake applying means, a leakage path between the output of said pump and said reservoir, a first variable orifice in said leakage path, said brake applying means being responsive to the supply of hydraulic fluid from said pump and passing through said first variable orifice, means for automatically varying the size of said first orifice in response to wheel speed to prevent said wheel from locking upon operation of said brake applying means, second variable orifice means upstream of said brake

applying means, and means cooperating with said second variable orifice means to provide a pressure drop of substantially constant value across said second variable orifice means over the range of wheel speeds and consequently a more linear wheel speed analogue of the pressure supplied by said pump to said brake applying means.

4,355,850
BEARING OF A TURBOMACHINE

Hiroshi Okano, Mishima, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jul. 10, 1980, Ser. No. 168,380
Claims priority, application Japan, Apr. 2, 1980, 55-41995
Int. Cl.³ F16C *7/04;* F04B *17/00;* F03B *11/06*
U.S. Cl. 308—9 **6 Claims**



1. A turbomachine having a housing, a rotary shaft rotatably inserted into said housing, and a non-contact type thrust air bearing for axially supporting the rotary shaft, wherein said thrust air bearing comprises a disc shaped hollow runner fixed onto the rotary shaft, and a pair of stationary bearing plates fixed onto the housing on each side of said runner and arranged to be spaced from said runner by a slight distance, said runner comprising a pair of opposite thin side walls, a cylindrical thin radially inner wall and a cylindrical thin radially outer wall, which define an interior chamber in said runner, and wherein neither the runner nor the shaft contacts the housing or the bearing plates.

4,355,851
DRAWER INTERLOCK SYSTEM

Boyd C. Slusser, Overisel, Mich., assignor to Herman Miller, Inc., Zeeland, Mich.

Filed Nov. 28, 1980, Ser. No. 211,352
Int. Cl.³ E05B *65/46;* E05C *7/06*
U.S. Cl. 312—215 **14 Claims**

1. In a cabinet including a housing, at least two drawers, means slidably mounting said drawers to the housing and an interlock mechanism for preventing the simultaneous opening of two drawers, the improvement in said interlock mechanism comprising:

an elongate channel mounted to said housing adjacent said at least two drawers, said channel having a fixed length and depth and including a bottom wall;

at least one block slidable in said channel along the length thereof, said at least one block including at least one end surface at an acute angle relative to the bottom wall of the channel;

at least two wedge members slidable relatively into and out of said channel in a direction perpendicular to the length of the channel;

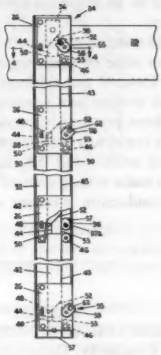
one of said wedge members disposed adjacent an end of said at least one block and a second of said at least two wedge members disposed adjacent another end of said at least one block;

each of said wedge members having a surface complementary to and in sliding contact with the end surfaces of said at least one block;

the fixed length of said channel being less than the combined length of said block and wedge members but at least as long as the combined length of said block and one of said wedge members;

cam means mounted on said housing adjacent said drawer and in contact with each of said wedge members for displacing one of said wedge members between a first position relatively in said channel and a second position relatively out of said channel;

actuator means cooperatively mounted between the drawers



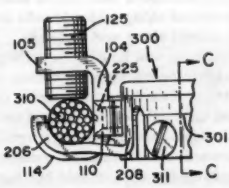
and the cam means for moving said cam means between said first and second positions upon opening of one drawer;

whereupon opening of one of said drawers said actuator means moves said cam means between said first and second positions so as to force one of said wedge members relatively into said channel so that the at least one block and the wedge members are displaced along the length of the channel to a position wherein the combined length of the block and wedge members is equal to the fixed length of the channel, thereby blocking any further movement of the wedge members in the channel to prevent the opening of a second drawer.

4,355,852
LAY-IN LUG WITH CONDUCTION PAD

Walter W. Bachle, Harwinton, Conn., assignor to General Signal Corporation, Stamford, Conn.

Filed Nov. 18, 1980, Ser. No. 207,847
Int. Cl.³ H01R *4/66*
U.S. Cl. 339—14 R **15 Claims**



1. A lay-in grounding lug to be secured to a bushing, or the like, and comprising in combination:

(a) a body member fabricated of a high yield strength material and including a back portion from which top and

bottom portions extend forward and substantially normal to said back portion and at opposite ends thereof;

(b) said bottom portion including leg portions extending therefrom;

(c) said body member further including a wing portion extending from each side edge of said back portion with each said wing extending at an angle backwards with respect to said back portion;

(d) a conduction member fabricated of a material having a low yield strength and superior electrical conducting characteristics both as compared with said body member;

(e) said conduction member including a back section with a wing section extending from each side edge of said back section and at an angle backwards with respect to said back section;

(f) each of said wing sections including a leg section extending from an edge of their respective wing sections and projecting forward and substantially normal to the plane of said back section; and wherein

(g) said members, portions, sections, and angles are proportioned with respect to each other so that the forward side of said back section and the rearward side of said back portion can make mating contact when said body member and said conduction member are appropriately juxtaposed.

4,355,853

ELECTRICAL JUNCTION BOX

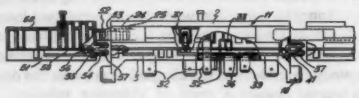
Friedrich J. A. Kourimsky, Bensheim, Fed. Rep. of Germany, assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 906,535, May 17, 1978, abandoned. This application Jan. 14, 1980, Ser. No. 111,739

Claims priority, application United Kingdom, May 21, 1977, 21534/77

Int. Cl.³ H01R *13/46*

U.S. Cl. 339—17 LM **6 Claims**



1. An automotive electrical junction box means comprising:

a main junction box comprising an insulating housing having a circuit board contained therein,

said housing having oppositely directed parallel main panel members, parallel oppositely directed sidewalls and parallel oppositely directed endwalls extending between said main panel members,

said circuit board extending parallel to, and being between, said main panel members, said circuit board having side edges which extend along said sidewalls and having end edges which extend along said endwalls,

a bus bar conductor in said housing extending between said end edges, circuit board terminal means on said circuit board, said circuit board terminal means comprising terminal tabs and terminal receptacles, said terminal tabs and said terminal receptacles extending normally of said circuit board towards said main panel members,

contact terminals on the ends of said bus bar, said contact terminals extending beyond said end edges of said circuit board and being mateable with complementary terminal means on auxiliary junction boxes and,

mechanical coupling means on said endwalls, said mechanical coupling means being cooperable with complementary coupling means on auxiliary junction boxes.

4,355,854

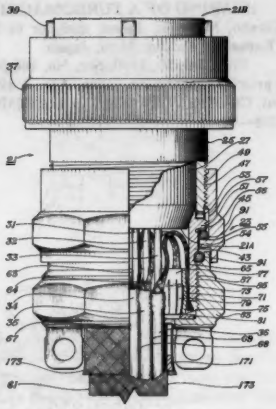
SELF-LOCKING MEANS

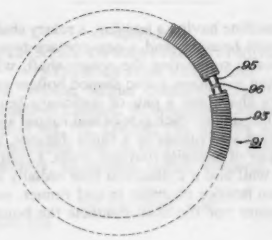
Robert A. Williams, 55 Bounty Rd. East, Fort Worth, Tex. 76116

Continuation-in-part of Ser. No. 959,695, Nov. 13, 1978, abandoned. This application Feb. 27, 1980, Ser. No. 125,161

Int. Cl.³ H01R *13/62*

U.S. Cl. 339—89 R **55 Claims**





1. A vibration resistant anti-counter rotational apparatus comprising:

first means;

second means having a portion adapted to be rotatably located around a portion of said first means,

said second means and said first means comprising wall structure defining an annular space when said portion of said second means is located around said portion of said first means,

said second means having thread means adapted to be threaded to other thread means when rotated in a first direction relataive to said first means, and

coiled spring means located in said annular space formed when said portion of said second means is located around said portion of said first means,

said coiled spring means being characterized such that adjacent coils of said coiled spring means are in close proximity to each other,

said wall structure of said second means and said first means engaging said coils of said spring means and canting said coils of said spring means in said first direction when said thread means of said second means are threaded to said other thread means upon rotation of said second means in said first direction, relative to said first means, whereby increased resistance is provided to rotation of said second means, relative to said first means, in a direction opposite said first direction,

said wall structure of said second means and said first means which engage said coils of said coiled spring means comprising smooth annular surfaces.

4,355,855

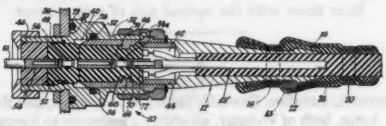
DEEP WATER CONNECTOR

Dimitri Rebikoff, 3060 SW. 4th Ave., Fort Lauderdale, Fla. 33315

Continuation of Ser. No. 9,797, Feb. 7, 1979, abandoned. This application Sep. 12, 1980, Ser. No. 186,752

Int. Cl.³ H01R *13/52*

U.S. Cl. 339—94 A 2 Claims



1. A watertight electrical connector for joining a first electrical cable and a second electrical cable separated by a boundary which segregates the environments in which the first and second electrical cables are placed, comprising:

a receptable means for mounting in said boundary, said receptable means including:

a generally cylindrical first body with a longitudinal through bore for defining an enclosed internal chamber, said first body having a first receptacle portion for connection of said first electrical cable on one side of said boundary and a second receptacle portion adjacent the other side of said boundary,

a first insert means having a first longitudinal hollow aperture therethrough carried by said first body in said longitudinal through bore,

a second insert means having a second longitudinal hollow aperture therethrough carried by said first body in said longitudinal through bore at the end of said first receptacle portion of said first body,

pin contact means for connecting said first electrical cable disposed in said longitudinal hollow aperture in said first and second insert means,

a first gasket means for compression between said boundary and said second receptacle portion such that a waterproof seal exists therebetween,

a second gasket means circumscribed about the longitudinal through bore of said first body for sealing said longitudinal through bore,

a plug means for engagement in said longitudinal through bore of said receptable means, said plug means including:

a generally cylindrical second body with a longitudinal through bore for defining an enclosed internal chamber, said second body having a first plug portion connectable in said longitudinal through bore of said receptacle means and a second plug portion which extends longitudinally beyond said receptacle means when said first plug portion is inserted therein;

reinforcing means for watertight connection of said second electrical cable to said second plug portion, such that any force which would tend to cause longitudinal movement of said second electrical cable relative to said second plug portion causes tightening of said reinforcing means proportional to said force, preventing movement of said second electrical cable.

4,355,856

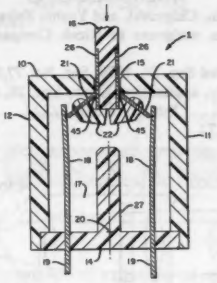
LOW INSERTION FORCE CONNECTOR USING NON-NOBLE METAL CONTACT PLATING

Warren W. Porter, Escondido, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed Oct. 6, 1980, Ser. No. 194,491

Int. Cl.³ H01R *13/38*

U.S. Cl. 339—95 R 14 Claims



1. An electrical connector for connecting to an edge contact of a printed circuit board or the like comprising:

(a) a pin made of an electrically conductive resilient material; and

(b) interconnection means for operatively connecting said pin to said edge contact, said interconnection means positioned within said electrical connector and actuated by an insertion of the printed circuit board or the like, said interconnection means being configured to have two ends such that the first end of said interconnection means makes a first contact point with said edge contact when said interconnection means is actuated by the insertion of said printed circuit board or the like, said interconnection means continuing a rotation motion as said printed circuit board or the like is further inserted, and the second end of said interconnection means makes a second contact point with said pin, the second end of said interconnection means causing said pin to be deflected as a result of said rotation motion of said interconnection means, said deflection causing a force to be transmitted through said first and second contact points, thereby permitting a piercing action to occur at said first and second contact points.

4,355,857

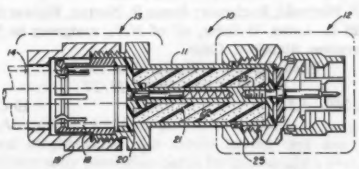
COAX PUSH-ON TEST CONNECTOR

Robert D. Hayward, 6142 N. 18th Ave., Phoenix, Ariz. 85015

Filed Nov. 7, 1980, Ser. No. 204,853

Int. Cl.³ H01R *17/18*

U.S. Cl. 339—177 R 10 Claims



1. Coaxial connector means providing push-on connection to the end of a coaxial cable comprising

slidable pressure contact means for slidably positioning said connector on the outer conductor of a coaxial cable and for maintaining contact therewith when so positioned so as to provide electrical continuity between itself and said outer conductor; and

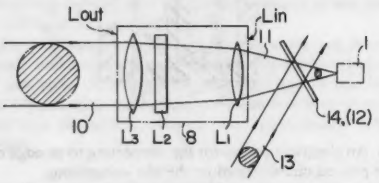
resilient in-line pressure contact means for resiliently maintaining in-line contact with the center conductor of a coaxial cable on whose outer conductor said slidable pressure contact means has been slidably positioned so as to provide electrical contact between itself and said center conductor.

4,355,858

HOLOGRAM LENS

Hiroyoshi Funato, Chigasaki, and Yoshio Fukushima, Machida, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 24, 1979, Ser. No. 77,943
Claims priority, application Japan, Sep. 28, 1978, 53-119457
Int. Cl.³ G02B *5/32*
U.S. Cl. 350—3.72 **2 Claims**



1. A hologram lens for converting an output beam of light emitted from semiconductor lasers to a reconstruction light suitable for reconstructing holograms, said lens being prepared by:

forming an object beam of light resembling a beam of light emitted divergently from a semiconductor laser for reconstructing holograms but traveling in the direction opposite to that of a beam of light from a semiconductor laser,

forming an iostropic reference beam of light having a circular cross section, and

directing said object beam of light and said reference beam of light onto a photosensitive member to form an interference pattern thereon,

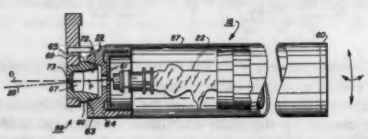
said object beam of light being obtained by using means including an optical system capable of converting an output beam from semiconductor lasers to an isotropic beam of light with a circular cross section when said output beam of light is caused to pass through said optical system from an input side thereof to an output side thereof, said object beam of light being obtained by causing an isotropic beam of light with circular cross section to pass through said optical system from said output side to said input side.

4,355,859

FIELD REPLACEABLE LASER APPARATUS FOR RASTER SCANNER

Robert P. Herloski, Rochester; James R. Norton, Walworth, and Ronald L. Antos, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 29, 1980, Ser. No. 191,981
Int. Cl.³ G02B *27/17, 11/27*
U.S. Cl. 350—6.1 **10 Claims**



1. Apparatus for supporting the laser assembly of a raster type scanner in operating position while permitting realignment of the laser assembly in the event laser alignment is disturbed as when servicing or replacing the laser assembly, the laser assembly including a laser and an elongated housing for said laser, the beam output by said laser exiting from one end of said housing, the combination of:

(a) journalling means for rotatably supporting said laser in said scanner;

(b) said journalling means being fixedly located in said scanner such that the center of rotation of said journalling means is coincident with a point on the optical axis of said scanner and said laser beam intercepts said optical axis at said point;

(c) said journalling means permitting said laser assembly to pivot about said journalling means center of rotation in plural directions; and

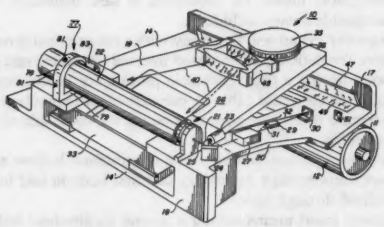
(d) means engageable with said housing adjacent the opposite end of said housing for incrementingly moving said laser assembly and pivoting said laser assembly about said journalling means center of rotation whereby to align said laser beam with the optical axis of said scanner.

4,355,860

DOUBLE PASS SCANNING SYSTEM

Pierre A. Lavallee, Penfield; Sidney W. Marshall, and Ronald L. Antos, both of Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 29, 1980, Ser. No. 191,796
Int. Cl.³ G02B *27/17*
U.S. Cl. 350—6.8 **6 Claims**



1. A symmetrical optical system for a raster scanner which minimizes the need for cross scan corrections and avoids the use of a toroidal type lens, comprising:

a plurality of reflective surfaces cooperable to form an optical path for causing a beam of light to impinge on the object to be scanned,

said reflective surfaces including a rotatable deflector for scanning said beam through a preset scan arc, and

at least one mirror for guiding said beam to said deflector so that said beam strikes said deflector once,

said deflector reflecting said beam directly back to said mirror whereby to provide a dual pass optical path between said deflector and said mirror, said mirror reflecting the beam from said deflector toward the object to be scanned.

4,355,861

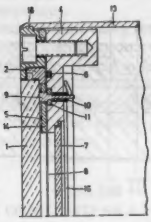
DEVICE FOR HEATING THE FRONT LENS OF A TELEVISION CAMERA

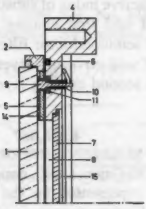
Richard Sebald, Wiesenttal, Fed. Rep. of Germany, assignor to Grundig E.M.V., Fuerth, Fed. Rep. of Germany

Filed Apr. 24, 1980, Ser. No. 143,930
Claims priority, application Fed. Rep. of Germany, May 30, 1979, 2921927
Int. Cl.³ G02B *11/04*
U.S. Cl. 350—61 **16 Claims**

1. A device for heating the front lens of a camera comprising:

a support means;
a transparent front lens supported by said means;
a transparent rear lens supported by said means;
a chamber disposed between said front and rear lens; and





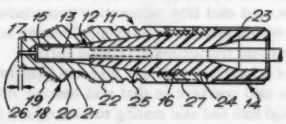
an electrical heating means located in said chamber and capable of heating the front lens so as to prevent interfering moisture which may come to be deposited thereon.

4,355,862

OPTICAL FIBRE TERMINATION

Konrad Kock, Rödermark, Fed. Rep. of Germany, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 25, 1980, Ser. No. 181,306
Claims priority, application United Kingdom, Sep. 1, 1979, 7930369
Int. Cl.³ G02B 5/14
U.S. Cl. 350—96.2 **3 Claims**



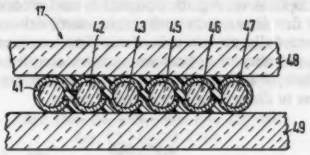
1. A method of terminating a glass optical fibre by clamping the optical fibre in a passageway in a ferrule with an end portion of the optical fibre core received in a bore in the ferrule end and projecting beyond the ferrule end; severing the end portion to provide an optical face at a predetermined distance from the ferrule end; and, radially crimping the ferrule to advance the ferrule relative to the optical fibre core to locate the ferrule end flush with the optical face.

4,355,863

CLADDED OPTICAL FIBER HAVING A LONGITUDINAL SIDE COUPLING ZONE

Hubert Aulich, and Franz Auracher, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 21, 1978, Ser. No. 944,366
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1977, 2744129
Int. Cl.³ G02B 5/172
U.S. Cl. 350—96.15 **2 Claims**



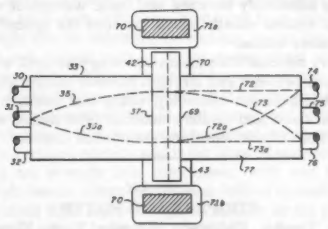
1. In a mixer composed of a plurality of optical fibers with each of the optical fibers having a core surrounded by a cladding layer of glass with an index of refraction lower than the index of refraction of the core so that a step occurs at the boundary of said cladding layer and core, the improvements comprising a plate, a plurality of fibers arranged beside one another in a row on said plate with said row having a pair of outermost fibers with the interior fibers being positioned therebetween, a second plate covering said row, and a light transmissive adhesive having an index of refraction exceeding the index of refraction of the cladding layer filling any interspaces between the fibers and said first and second plates, each of the fibers having at least one longitudinal opening in the cladding layer to expose a portion of the core to form a coupling zone facing a coupling zone of an adjacent interior fiber and each interior fiber having a pair of peripherally spaced coupling zones facing coupling zones of adjacent fibers.

4,355,864

MAGNETOOPTIC SWITCHING DEVICES

Richard A. Soref, Newton Centre, Mass., assignor to Sperry Corporation, New York, N.Y.

Filed Mar. 26, 1980, Ser. No. 134,048
Int. Cl.³ G02B 5/172; G02F 1/01
U.S. Cl. 350—96.18 **22 Claims**



11. An optical switching device comprising:
planar magnetizable film means having first and second substantially parallel surfaces for generating a plurality of stripe domains therewithin when a magnetic field having components within said magnetizable film means substantially parallel to said first and second surfaces is applied thereto,
first lens means positioned with a first surface thereof coupled to said first surface of said magnetizable film means for converting a diverging light beam incident to a second surface thereof to a substantially collimated light beam

incident to said magnetizable film means, said first lens means having a circular cylindrical form with an axis substantially perpendicular to said first and second surfaces of said magnetizable film means,

second lens means coupled to said second surface of said magnetizable film means at a second surface thereof for focussing collimated light emerging from said magnetizable film means to preselected regions on a first surface thereof, said preselected regions being determined by said applied magnetic field, said second lens means having a circular cylindrical form with an axis substantially perpendicular to said first and second surfaces of said magnetizable film means,

a first optical waveguide coupled to said second surface of said first lens means with a cross-sectional center thereof substantially on said axis of said first lens means, and

a first plurality of optical waveguides coupled to said first surface of said second lens means at said preselected regions in diametrically positioned pairs.

4,355,865

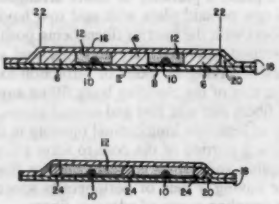
LAMINATED OPTICAL FIBER CABLE

Lee R. Conrad, Lewisberry, and Edward C. Dowling, Sr., Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 21, 1980, Ser. No. 132,436

Int. Cl.³ G02B 5/16

U.S. Cl. 350—96.23 **5 Claims**



1. A fiber optic ribbon cable comprising:

bottom sheath means;

a plurality of strength member means spaced from one another and extending along said bottom sheath means;

optic waveguide means disposed between the spaced strength member means and extending along said bottom sheath means;

means bonding said strength member means in fixed positions on said bottom sheath means;

means adhesively securing said optic waveguide means on said bottom sheath means between the spaced strength member means;

insulary material filler means covering said optic waveguide means between said strength member means; and

top sheath means extending along said strength member means and said insulary material filler means with edge portions of said sheath means bonded together.

4,355,866

STRIPE-COLOR FILTER

Elichiro Tanaka, Kishiwada; Kousaku Yano, Higashiosaka; Yoshitaka Aoki, Kadoma, and Shinji Fujiwara, Minoo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Aug. 20, 1980, Ser. No. 179,875

Claims priority, application Japan, Aug. 21, 1979, 54-106947; Jun. 5, 1980, 55-76490

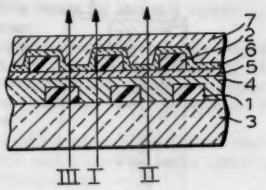
Int. Cl.³ G02B 5/22, 5/28

U.S. Cl. 350—164 **6 Claims**

1. A stripe-color filter having a striped semiconductor filter-element-layer supported between a transparent substrate layer and a transparent dielectric covering layer, further comprising:

a first coating layer of a transparent thin film interposed between said transparent substrate layer and said semiconductor filter-element-layer; and

a second coating layer of a transparent thin film interposed between said semiconductor filter element layer and said transparent covering layer;



the refractive indexes of those layers being in the relationship: $n_F > n_{71} > n_S$ and $n_F > n_{72} > n_D$, wherein n_S represents the refractive index of substrate layer, n_{71} the refractive index of said first coating layer, n_F the refractive index of said semiconductor filter element, n_D the refractive index of said covering layer, and n_{72} the refractive index of said second coating layer.

4,355,867

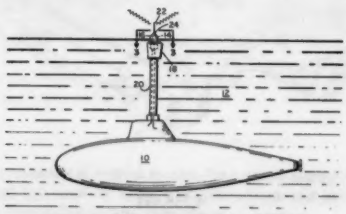
SPHERICAL SEGMENT INSERTION APPARATUS

Jerry D. Stachiw, El Cajon, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 2, 1981, Ser. No. 222,114

Int. Cl.³ G02B 7/02

U.S. Cl. 350—319 **7 Claims**



1. An apparatus for enabling selected structure to be joined to a spherical lens, said lens formed of material which is transmissive to radiation of selected frequencies, said apparatus comprising:

a lens penetration component, said component being insertable into an aperture through said spherical lens, said aperture being circumscribed by a frustoconical bearing surface, and said lens penetration component being provided with a metallic frustoconical seating surface which matches said frustoconical bearing surface;

means for selectively retaining said lens penetration component in said aperture so that said bearing surface of said spherical lens and said seating surface of said lens penetration component are maintained in abuttable relationship while allowing said selected structure to be detached from said lens;

a frustoconical gasket which is positionable between said bearing surface and said seating surface for resisting wear between said bearing surface and said seating surface when said lens is subjected to substantial external pressure;

compliant means positioned between said lens penetration component and said spherical lens for sealing said spherical lens from external pressures when said retaining means

maintains said abuttable relationship between said bearing surface and said seating surface;

a number of structure-adapted core components, each of said structure-adapted components comprising means joined to a particular structure for enabling said particular structure to be selectively joined to and detached from said lens penetration component;

means are provided for removably seating one of said structure-adapted core components in a seating recess which is provided in said lens penetration component; and

said supporting means includes means for sealing the joint between said lens penetration component and a structure-adapted core component seated in said recess against extreme external pressures.

4,355,868

TRANSFLECTOR DESIGNED AS A FOIL FOR USE WITH LIQUID CRYSTAL DISPLAYS

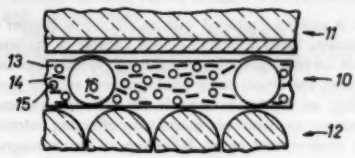
Alain Perregaux, Wettingen, and Toni Bunschi, Flüelen, both of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed May 1, 1980, Ser. No. 145,819

Claims priority, application Switzerland, May 31, 1979, 5071/79

Int. Cl.³ G02F *1/133*

U.S. Cl. 350—338 15 Claims



15. A transflector designed as a foil provided with an optically transparent matrix material and at least a similarly transparent filling material, the refraction index of which is larger than that of the matrix material, said filling material comprising mica discs coated with titanium dioxide.

4,355,869

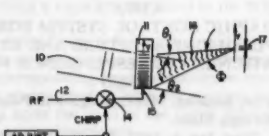
SELF SCANNED OPTICAL FOURIER TRANSFORM ARRANGEMENT

Shi-Kay Yao, Anaheim, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 29, 1980, Ser. No. 154,246

Int. Cl.³ G02F *1/11*

U.S. Cl. 350—358 7 Claims



1. An optical system comprising:

input means for providing an information-containing input signal having a frequency in the RF portion of the spectrum;

chirp means for providing a linear frequency modulated signal with substantially constant amplitude;

mixing means connected to said input means and said chirp means for producing a modulating signal;

a source for emitting a beam of radiation;

accoustical optical modulation means disposed in the path of said beam, and connected to said input means and driven by said modulating signal, said modulation means functioning to modulate said beam with information derived from said input signal to produce a modulated travelling beam; and

a single detector disposed in the path of said modulated beam for detecting the resulting optical intensity distribution at the focal point of said modulated beam, said resulting distribution representing a Fourier transform of said information containing input signal.

4,355,870

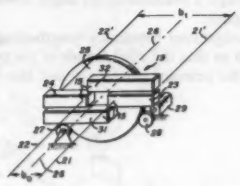
RHOMBOID PRISM PAIR FOR ROTATING THE PLANE OF PARALLEL LIGHT BEAMS

Alan M. Lovelace, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Kenneth L. Orloff, and Haruo Yanagita, both of Cupertino, Calif.

Filed Dec. 24, 1980, Ser. No. 219,640

Int. Cl.³ G02B *7/18*

U.S. Cl. 350—486 6 Claims



2. In an optical system for rotating the plane defined by first and second parallel light beams; first and second pairs of rhomboid prism means, each prism means having an input face disposed generally normally to a respective one of the first and second light beams for receiving thereon and transmitting the beam therethrough into each of the respective prisms, each prism means having a first internal face inclined to the inputted light beam for internally reflecting the respective beam within the respective prism, each of said prism means having a second internal face generally parallel to said first internal face for internally reflecting the respective beam generally parallel to said respective inputted light beam, and each of said prism means having an output face generally perpendicular to the light beam incident thereon for directing the beam out of said prism means generally parallel to said respective input beam; said first pair of rhomboid prism means being disposed in a first position to receive on their respective input faces said first and second light beams, respectively; rotating means for rotating said first and second pairs of prism means about an axis of revolution which is disposed midway between the two parallel beams and which is parallel thereto; said second pair of prism means being disposed relative to said first pair of prism means so that when said first and second pairs of prism means are rotated to a second position said input faces of said second pair of prisms are brought into coincidence with said first and second light beams, whereby the plane defined by said first and second output light beams is rotated relative to the plane defined by said pair of input light beams.

4,355,871

KERATOMETER

Herbert J. Nevyas, Narberth, Pa., and Alan C. Traub, Framingham, Mass., assignors to Diversitronics, Inc., Broomall, Pa.

Filed Jul. 14, 1980, Ser. No. 168,813

Int. Cl.³ A61B *3/10*

U.S. Cl. 351—13 34 Claims

6. An optical device for measuring the sphericity of the corneal tissue in a vertebrate eye whereby an astigmatic condition can be detected and measured comprising:

a light source for illuminating a target which reflects image-forming light rays which travel over a primary optical path;

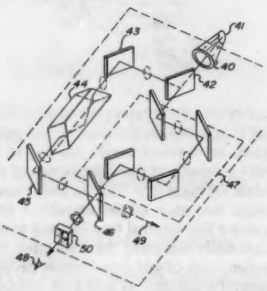
first beamsplitter means for deflecting a predetermined portion of the image-forming light rays emanating from the target through a predetermined angle away from the direction of the primary optical path and permitting the remainder of the imageforming light rays emanating from the target to pass through said first beamsplitter means uninterrupted, said remainder of the image-forming light rays forming a primary ray family and said predetermined portion of the image-forming light rays forming a secondary ray family;

first mirror means for deflecting the secondary ray family through a predetermined angle so that the primary ray family and the twice deflected secondary ray family are parallel and travelling in the same direction over separate optical paths;

image rotating means for rotating the secondary ray family through an angle of 90° about its propagation axis;

second mirror means for deflecting the secondary ray family through a predetermined angle toward the primary optical path;

path lengthener means for lengthening the primary optical path so that the total length of the optical paths travelled by the primary ray family and the secondary ray family



are equal so as to provide a primary image and a secondary image in the same viewable plane, said primary image is the resulting image of the primary ray family and said secondary image is the resulting image of the secondary ray family;

second beamsplitter means for deflecting a predetermined portion of the secondary ray family through a predetermined angle into the direction of the primary optical path, permitting the remainder of the secondary ray family to pass through said second beamsplitter means uninterrupted, deflecting a predetermined portion of the primary ray family through a predetermined angle away from the direction of the primary optical path into the same direction as the remainder of the secondary ray family, permitting the remainder of the primary ray family to pass through said second beamsplitter means uninterrupted, thus combining the secondary ray family with the primary ray family so that they result in a superposed image of coincident image-forming light rays formed from said primary image and said secondary image rotated 90° with respect to said primary image;

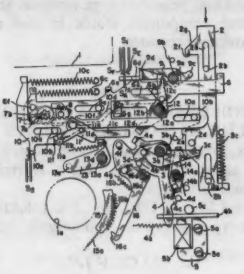
whereby the recombined superposed image formed from said primary and said rotated secondary images are transmitted and magnified as they pass through an optical instrument having a means for visually comparing and measuring the superposed image in order to determine sphericity of the corneal tissue.

4,355,872

CAMERA EQUIPPED WITH ELECTRONIC SHUTTER HAVING AUTOMATIC FOCUS DETECTING DEVICE

Kiyoshi Kitai; Tadashi Nakagawa, and Hiroaki Ishida, all of Shikawatashi, Japan, assignors to Seiko Koki Kabushiki Kaisha, Japan

Filed Jan. 23, 1979, Ser. No. 5,778
Claims priority, application Japan, Jan. 24, 1978, 53-6409
Int. Cl.³ G03B 7/08, 7/00
U.S. Cl. 354—25 **2 Claims**



1. A camera equipped with an electronic shutter having an automatic focus detecting device capable of automatic focusing of the photographing lens through detection of the distance between the object being photographed and the camera comprising: an electronic module for effecting automatic focus detection; an electronic module for effecting automatic exposure control; and means including an electromagnet successively connectable to both of said electronic modules as a function of the camera release operation such that said electromagnet is controlled by said electronic module for effecting automatic exposure control to adjust the exposure after said electronic module for effecting automatic focus detection has controlled said electromagnet to determine the focus position, said means including a control member movable successively from a first position to a second position and to a stop position and being prevented from undergoing movement when attracted by said electromagnet, and obstructing means for retaining said control member at said second position thereby obstructing further movement of said control member until the connection of said electromagnet to said electronic module for effecting automatic focus detection is changed-over to the connection of said electromagnet to said electronic module for effecting automatic exposure control.

4,355,873

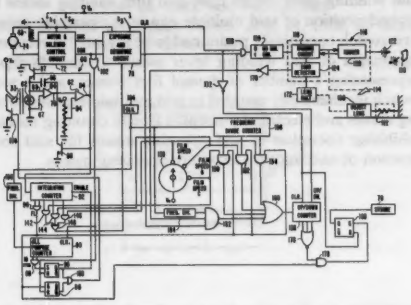
PHOTOGRAPHIC CONTROL SYSTEM FOR VARYING BOTH FLASH FIRE APERTURE AND EXPOSURE TERMINATION IN CORRESPONDENCE WITH FILM SPEED

Peter P. Carcia, Reading, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jun. 8, 1981, Ser. No. 271,579
Int. Cl.³ G03B 7/097, 7/16
U.S. Cl. 354—27 **9 Claims**

1. In a photographic exposure control system for use with a source of artificial illumination and for controlling the exposure of a photosensitive recording medium, the system having a shutter arrangement for at least initially providing progressively increasing aperture values at a predetermined rate during an exposure interval within which scene light is transmitted to the photosensitive medium following actuation of the shutter arrangement, and means for providing a flash fire signal to ignite the source of artificial illumination during the exposure interval at an appropriate follow focus aperture value corre-

sponding to the subject distance, the improvement comprising selectively actuatable means for varying the follow focus aper-



ture at which the flash fire signal is provided in correspondence with different ones of a select plurality of film speeds.

4,355,874

PROGRAM EE CAMERA

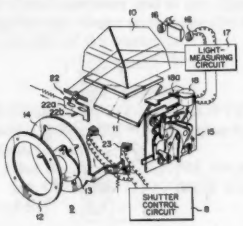
Yoshihisa Maitani, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 10, 1979, Ser. No. 65,608

Claims priority, application Japan, Aug. 22, 1978, 53-102186

Int. Cl.³ G03B *7/087, 7/12, 17/20*

U.S. Cl. 354—31 **5 Claims**



2. A program EE single lens reflex camera capable of utilizing various interchangeable lenses having different maximum opening aperture sizes comprising:

a diaphragm;

a ring for opening and closing said diaphragm;

a lever connected to drive said ring;

a first light measuring circuit including light sensing means for generating a signal proportional to the brightness of a subject;

diaphragm control means for moving said lever to set the diaphragm opening to one of a few predetermined coarse settings corresponding to about maximum opening, about minimum opening and at least one opening therebetween depending upon the level of the signal generated by said first light measuring circuit;

said diaphragm control means comprising a movable cam plate having a cam surface with a few steps and a member having a needle movable by a signal of said first light measuring circuit to be engageable with a predetermined portion of the cam surface such that said movable cam plate is stopped to a position corresponding to the brightness of the light from the subject, the moving position of the diaphragm lever being determined according to the position of said movable cam plate; and

a second light measuring circuit independent of said first for continuously controlling shutter speed in accordance with brightness of the subject light, including at least one photosensitive means for receiving light from the subject reflected from at least one of a film surface and a shutter blind surface after the light passes through the diaphragm opening set by said control means.

4,355,875

AUTOMATIC DIAPHRAGM CONTROL DEVICE FOR CAMERAS

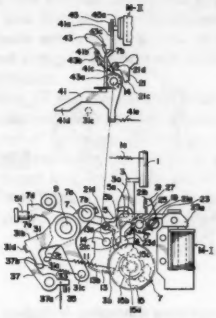
Keiji Yamazaki, and Toshio Kobori, both of Sakai, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 20, 1981, Ser. No. 255,493

Claims priority, application Japan, Apr. 24, 1980, 55-53548

Int. Cl.³ G03B *9/06*

U.S. Cl. 354—38 **13 Claims**



1. An automatic diaphragm control device for a camera which includes an exchangeable lens having an objective, a diaphragm and a diaphragm interlock member interlocked with said diaphragm to move therewith, said device comprising:

a diaphragm operating mechanism interlocked with said diaphragm interlock member and movable from a reset position to an operating position for stopping-down said diaphragm through said diaphragm interlock member;

diaphragm stop means movable from a reset position to an operating position and including a stop lever engaging said diaphragm operating mechanism to stop the latter mechanism with said diaphragm stop means being at the operating position and said stop lever being retracted from said diaphragm operating mechanism with said diaphragm stop means at the reset position;

diaphragm determination electromagnetic means capable of restraining said diaphragm stop means at the reset position and releasing said diaphragm stop means upon actuation thereof;

a light measuring circuit for measuring scene brightness through said objective and said diaphragm which is being stopped-down by said diaphragm operating mechanism through said diaphragm interlock member and generating a light measurement signal which varies with the stopping-down of said diaphragm;

a reference signal generator for generating a reference signal to be compared with said light measurement signal;

means for comparing said light measurement signal with said reference signal to generate a diaphragm stop signal for actuating said diaphragm determination electromagnetic means when said light measurement signal represents a given relationship with respect to said reference signal;

release interlock means movable from a reset position for restraining both said diaphragm operating mechanism and said diaphragm stop means at the respective reset positions thereof to an operating position to release both said diaphragm operating mechanism and said diaphragm stop means to allow simultaneous movement thereof from said reset positions to said operating positions;

release electromagnetic means capable of restraining said

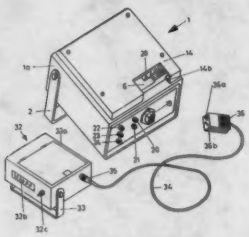
release interlock means at the reset position and releasing said release interlock means upon actuation thereof; and circuit means for actuating said release electromagnetic means in response to a camera actuating operation.

4,355,876

CONTROL DEVICE HAVING AN INTERNAL ELECTRIC OR VOLTAGE SOURCE

Franz Starp, Mittlere Steige 36, 7547 Wildbad 5, Fed. Rep. of Germany

Filed Mar. 16, 1981, Ser. No. 244,474
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1980, 3010304
Int. Cl.³ G03B 17/00; H01R 13/62
U.S. Cl. 354—202 10 Claims



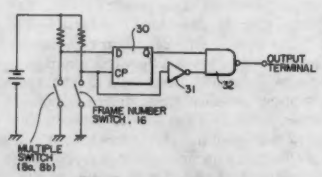
1. Device comprising a housing including at least one current user having an electrical power receiving plug coupling on the housing and operatively arranged for receiving electrical power for operating the current user upon connection with a power source plug member, an internal electrical power source in the housing and having a displaceable internal power plug member removably connectable to the current user plug coupling and operatively arranged for supplying electrical power from the internal power source upon connection of the internal plug member to the current user plug coupling, and guide means for guiding the internal plug member for displacement between a connected position with the plug coupling and a disconnected position sufficiently spaced therefrom to provide a reception region permitting a separate external electrical power source to be connected to the current user plug coupling thereat.

4,355,877

MECHANISM FOR COUNTING FILM FRAMES IN CAMERA WITH MULTIPLE EXPOSURE MODE

Tahei Morisawa, Matsudo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 10, 1981, Ser. No. 233,233
Claims priority, application Japan, Feb. 20, 1980, 55-20312
Int. Cl.³ G03B 17/36
U.S. Cl. 354—217 11 Claims



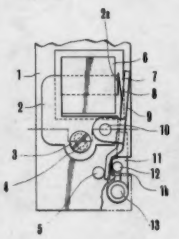
1. A camera mechanism for counting film frames in a camera having normal and multiple exposure modes, comprising: winding lever means; film winding means; shutter charging means, said shutter charging means being operatively coupled to be actuated by operation of said winding lever means; multiple exposure operating means; means for engaging said winding lever means with said film winding means for a first position of said multiple exposure operating means and disengaging said winding lever means from said film winding means for a second position of said multiple exposure operating means; a first switch operatively positioned to be actuated in response to movement of said winding lever means for counting pulses representing a number of wound film frames; and a second switch mechanically coupled to said multiple exposure operating means and electrically coupled to said counting means for inhibiting operation of said counting means for said second position of said multiple exposure operating means.

4,355,878

MAGNETIC DEVICE

Takehiko Ohniwa, Chichibu; Michio Senuma, Tokyo; Fumio Shimada, Kawasaki; Syuichiro Saito, Kawasaki; Yoshihiro Shigeta, Tokyo, and Hiroshi Aizawa, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo and Canon Denshi Kabushiki Kaisha, Saitama, both of, Japan

Filed Jul. 1, 1981, Ser. No. 279,256
Claims priority, application Japan, Jul. 7, 1980, 55-95774[U]
Int. Cl.³ G03B 9/08; H01F 7/14
U.S. Cl. 354—234 1 Claim



1. A magnetic device for a camera including a shutter hold claw for holding a shutter screen at a certain predetermined position comprising

(a) a conductive member, said member being supplied with a current so as to form magnetic flux along a certain determined direction;

(b) a yoke consisting of a material with high magnetic permeability so as to direct the magnetic flux formed with said conductive member;

(c) a base plate with a rotation shaft, said yoke being supported rotatably on said base plate by said rotation shaft;

(d) an elastic member;

(e) a stopper on said base plate;

(f) an armature rotatably supported by said rotation shaft commonly with said yoke and having a pair of arms oppositely extending from said shaft, one arm being drawn by a part of said yoke, the other arm being positioned so as to strike said shutter hold claw and being normally biased to a certain distance from said shutter hold claw by said elastic member to contact said stopper on said base plate; and

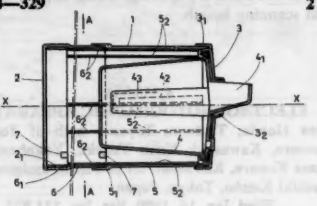
(g) a yoke securing member capable of securing said yoke at a different position from that of the rotation shaft on said base plate after the yoke has been rotated around the rotation shaft by a certain determined amount.

4,355,879

PHOTOGRAPHIC DEVELOPING TANK

Guy Faubert, Creteil, France, assignor to Diaralux, Creteil, France

Filed Feb. 24, 1981, Ser. No. 237,663
Claims priority, application France, Aug. 14, 1980, 80 18004
Int. Cl.³ G03D 3/00, 13/04
U.S. Cl. 354—329 2 Claims



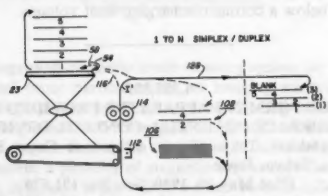
1. A photographic developing tank comprising a cylindrical container of circular section (1) closed by end panels (2,3), one of said panels being provided with an orifice (3_2) for the introduction of a developing product for acting on sensitized paper disposed inside the tank, and one of said panels being movable from a first end of said cylindrical container, said container further having on its internal surface longitudinal ribs for the positioning of said sensitive paper, said tank further comprising a cylindrical sleeve (6) the internal diameter of which corresponds to that of the container and the internal surface of which is provided with longitudinal ribs (6_2) corresponding in position and dimension to those of the container, said sleeve being engageable between said first end of the container and said removeable end panel, alignment means being provided at said first end of said container and at the adjacent end of said sleeve for aligning said sleeve so that the ribs of the sleeve are aligned with the ribs of the container.

4,355,880

FORWARD ORDER DOCUMENT COPYING METHOD

Denis J. Stemmle, Williamson, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 2, 1980, Ser. No. 155,868
Int. Cl.³ G05G 15/00; B65H 5/00
U.S. Cl. 355—3 SH 7 Claims



4. In a method of pre-collation copying of a set of plural (multi-page) simplex (one-image-side) document sheets in which the one image side of said simplex document sheets are presented to an imaging station of a copier seriatim and multiply recirculated between a stacked set of said document sheets and said imaging station, and copied only once on said one side per circulation at said imaging station, by feeding said document sheets seriatim from the bottom of said stack to one side of said imaging station and then returning the document sheets from the opposite side of said imaging station to the top of said same stack in a recirculatory loop path in each said circulation, the improvement comprising:

stacking said set of simplex document sheets in proper page order, but image face-down, with the first image page on the bottom of the stack, in a stacking position overlying said imaging station,

in only the first and last circulations of said document set, feeding said simplex document sheets through a first document path between the bottom of said stack and said one side of said imaging station, which first document path does not invert said simplex document sheets, and

in all other circulations of said document set other than said first and last circulations, feeding said simplex document sheets through a second document path with a single inversion from said stack to said one side of said imaging station, and

wherein for all of said circulations said simplex document sheets are fed from said imaging station back to said stack in a third document path with a single inversion, so that said document sheets are circulated in forward serial page order, and circulated in a uni-directional endless loop path in all but said first and last circulations,

so that during said first and last circulations said simplex document sheets are inverted a total of only once per circulation and returned to said stack inverted from their previous orientation, ·

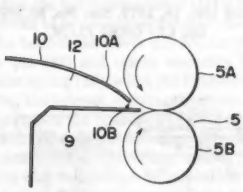
and so that during all said circulations other than said first and last circulations said simplex document sheets are inverted a total of twice per circulation to maintain the same sheet orientation in said stack, so that in all said circulations except said last circulation the same one (image) sides of said simplex document sheets are presented for copying to said imaging station in forward serial page order.

4,355,881

RECORDING APPARATUS HAVING ROLLER TYPE FIXING DEVICE

Noriyoshi Tarumi, Hachioji; Kiyoaki Kawamoto, Kunitachi; Kenji Ueno, Hachioji, and Hirofumi Sakaguchi, Akikawa, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jun. 23, 1980, Ser. No. 161,866
Claims priority, application Japan, Jun. 28, 1979, 54-80779
Int. Cl.³ G03G 15/20
U.S. Cl. 355—3 FU 6 Claims



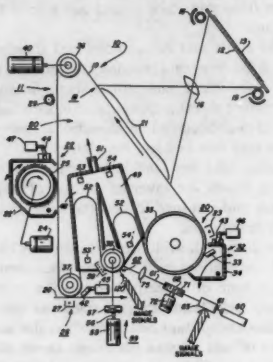
1. A recording apparatus having a roller type fixing device made up of a first roller and a second roller for fixing the image to the transfer paper, comprising an upper guide plate placed over the transfer paper passage on the inlet side of the roller type fixing device, the upper guide plate being curved down gradually toward the front end of the fixing device in the direction of the paper feed and having a front edge extending near the lower portion of the first roller so that an angle α less than 80° is made by a line parallel to the direction of the paper feed and a line tangent to the outer circumferential surface of the first roller at a point where a line passing through the front edge of the upper guide plate intersects the circumferential surface of the first roller.

4,355,882

MULTIPLE FUNCTION REPRODUCTION APPARATUS

Christopher Snelling, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 26, 1981, Ser. No. 238,509
Int. Cl.³ G03G 15/00
U.S. Cl. 355—3 BE 18 Claims



1. In a multi-mode reproduction apparatus, the combination of:

(a) an overlong photoconductive belt;

(b) xerographic processing means in operative relation with a first portion of said belt;

(c) scanning means in operative relation with a second portion of said belt;

(d) first drive means for moving said first belt portion at a preset xerographic processing speed;

(e) second drive means for moving said second belt portion at a preset scanning speed; and

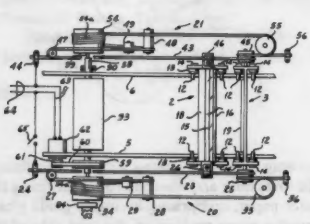
(f) belt takeup means between said first and second belt portions to accommodate any difference in speed or operating cycle between said xerographic processing means and said scanning means.

4,355,883

PHOTOCOPIER SCANNING APPARATUS

Benzion Landa, Edmonton, Canada, assignor to Savin Corporation, Valhalla, N.Y.

Filed Oct. 15, 1979, Ser. No. 85,109
Int. Cl.³ G03G 15/28
U.S. Cl. 355—8 16 Claims



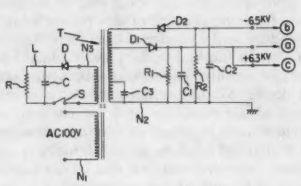
2. Photocopier apparatus for scanning along a certain length including in combination a full-rate scanning carriage, a half-rate scanning carriage, each carriage having a center of gravity, a pair of cables, means securing the cables to the full-rate carriage at widely spaced points on either side of its center of gravity, a pair of pulleys journaled on the half-rate carriage at widely spaced locations on either side of its center of gravity, each one of said cables engaging a corresponding one of said pulleys, a guide, means including a first pair of bearings having a first relatively small longitudinal spacing for supporting the full-rate carriage on the guide, means including a second pair of bearings having a second relatively small longitudinal spacing for supporting the half-rate carriage on the guide; and means for synchronously moving said cables to drive both scanning carriages in the same direction along the guide, each of said first and second spacings being appreciably less than half said scanning length.

4,355,884

ELECTROPHOTOGRAPHIC APPARATUS

Haruhisa Honda; Tsutomu Toyono, both of Tokyo; Shunji Nakamura, Kawasaki; Kano Tanaka, Yokohama, and Yoshimasa Kimura, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 14, 1980, Ser. No. 111,972
Claims priority, application Japan, Jan. 20, 1979, 54-5813; Jan. 20, 1979, 54-5814
Int. Cl.³ G03G 15/00
U.S. Cl. 355—14 CH 11 Claims



1. A high voltage generating device which supplies electric voltage to corona dischargers in an electrophotographic apparatus, comprising:

(a) a primary winding, to which an input power source voltage is applied;

(b) a secondary winding having taps for providing voltage outputs to corona dischargers of a specific polarity and the opposite polarity;

(c) a tertiary winding; and

(d) switching means connected to said tertiary winding, for lowering the secondary output voltage of a specific polarity below a corona discharging limit voltage.

4,355,885

IMAGE FORMING APPARATUS PROVIDED WITH SURFACE POTENTIAL CONTROL DEVICE

Nao Nagashima, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 20, 1980, Ser. No. 151,676
Claims priority, application Japan, May 29, 1979, 54-67162
Int. Cl.³ G03G 15/00
U.S. Cl. 355—14 CH 12 Claims

1. Image forming apparatus provided with a surface potential control device, comprising:

an image bearing member;

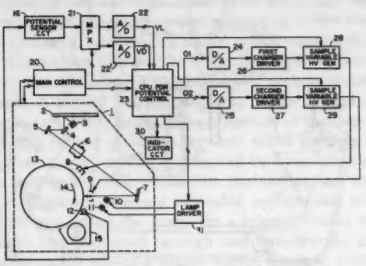
output means for use in forming a latent image on said image bearing member wherein said output means produces a variable output to control the surface potential of said image bearing member;

measuring means to measure the surface potential on said image bearing member; and

means to discriminate the magnitude of an output from said measuring means with respect to a reference value,

and for causing said reference value to vary by a predetermined value in accordance with a discriminated output, said predetermined value being gradually changed in

accordance with the process of the discrimination operation, said discriminating means having an output coupled



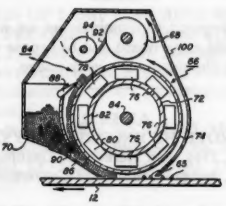
to said output means for controlling said variable output thereof.

4,355,886

POLYVINYL ACETAL COATED CARRIER PARTICLES FOR MAGNETIC BRUSH CLEANING

Steven R. Perez, Pittsford, N.Y.; Philip G. Horton, Greenville, S.C., and Jan M. Wlochowski, Pittsford, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 13, 1980, Ser. No. 149,379
Int. Cl.³ G03G *21/00*
U.S. Cl. 355—15 10 Claims



1. An improved magnetic brush cleaning system for removing residual toner particles from an imaging surface in an electrostatographic copying device, the cleaning system containing a magnetic brush roller positioned adjacent to the area of the imaging surface to be cleaned, a plurality of magnets located therein, a plurality of magnetic carrier particles adhering to the magnetic brush roller, a toner reclaim roller positioned adjacent to the path of the magnetic brush roller, allowing the carrier particles to contact the toner particles thereon, means for electrically biasing the magnetic brush roller to a voltage of between about 50 volts and about 400 volts to assist in attracting the residual toner particles from the imaging surface and onto the carrier particles;

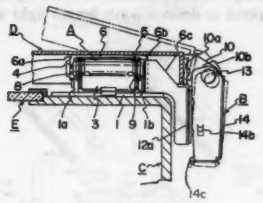
and means for electrically biasing the toner reclaim roll to a negative polarity of up to about 400 volts to assist in removing the toner particles from the carrier particles, the improvement residing in the utilization of electrically insulating carrier particles having a resistivity of more than 10^{10} ohm-cm, and a triboelectric charge of at least about −15 microcouloms per gram, said carrier particles being comprised of a core having an average diameter of from between about 30 microns and about 1,000 microns, said core having an outer coating comprising a polyvinyl acetal.

4,355,887

DOCUMENT HOLD-DOWN COVER ARRANGEMENT FOR A COPY MACHINE

Akira Sorimachi, Yokohama, Japan, assignor to Katoh Electrical Machinery Co. Ltd., Yokohama, Japan

Filed Aug. 25, 1980, Ser. No. 181,050
Claims priority, application Japan, Aug. 31, 1979, 54-120127[U]
Int. Cl.³ G03B *27/32*
U.S. Cl. 355—25 2 Claims



1. A document hold-down cover for a copy machine, for holding material to be copied onto the transparent top of the copy machine, comprising in combination:

(a) a deck plate (C) on said copy machine having a horizontal support portion;

(b) lifting means (A) affixed to said deck plate (C) horizontal portion, said lifting means having a rectangular base plate (1) over said deck plate (C) with side wall plates (*1a, 1b*), a pair of first elevational arms (3) pivotally connected to said wall plates (*1a, 1b*), a pair of second elevational arms (5) pivotally connected to said first elevational arms so that said first and second elevational arms can telescope in the vertical plane;

(c) hinge means (B) comprising a hinge bracket (12) pivotally connected to said second elevational arms (5), a cover retainer (10) pivotally connected to said hinge bracket (12) by a hinge pin (11), a spring cover also pivotally connected to said cover retainer (10) by a rivetting pin (13), and a coiled compression spring (15) interposed between the spring cover (14) and said hinge bracket (12) with frictional resilient means coupled to the spring cover (14 and the cover retainer (10) to provide controlled smooth swing movement; and,

(d) a document hold down cover (D) fixedly attached to said cover retainer (10) of said hinge means (B);

whereby, when the hold-down cover (D) is opened in order to put material to be copied on the copy machine transparent top, the hold-down cover (D) rotates about the axis of the hinge pin (11) and opens smoothly because of the compression spring (15), when the hold-down cover (D) is closed, the hold-down cover progresses smoothly and slowly because of the resiliency of the coil spring and the lifting means (A) does not function, but when the material to be copied is thick, the lifting means (A) is provided leverage by the material to be copied so that the lifting means (A) raises the hinge means (B) the required heighth, bringing the hold-down cover in parallel with the transparent top (E).

4,355,888

MEANS AND A METHOD FOR COLOR SEPARATION AND FOR REPRODUCTION

Robert E. Pearson, 10745 33rd Northeast, Seattle, Wash. 98155

Filed Sep. 24, 1973, Ser. No. 399,805
Int. Cl.³ G03B *27/32, 27/52;* G02B *5/23;* G02F *1/01*
U.S. Cl. 355—32 121 Claims

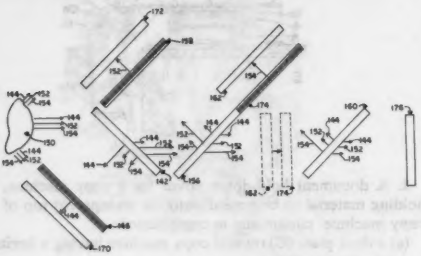
1. An optical means for controlling, separating and extracting from polychromatic electromagnetic wave energy to realize desired wave length light waves and for reproducing a geometric image from said desired wave length light waves, the improvement being to encompass control and separation of

the visible and near visible electromagnetic spectrum, substantially, simultaneously, primarily, without absorption and energy loss therefrom, said means comprising:

a. a control responsive to light waves;

b. said control in response to said light waves, controlling the electromagnetic wave energy to realize said desired wave length light waves;

c. said control comprising an optical electromagnetic reflective and transmittive means consisting of thin film coatings of high and low refractive index layers formulated to correspond to desired wave length light waves and positioned in the image plane of view and whose attenuation characteristics are functioned by structural design responsive to the desired wave length light waves wherein such desired wave length light waves are caused to be extracted by reflection from said optical electromagnetic reflective and transmittive means while all other incident radiation is transmitted through said optical electromagnetic reflective and transmittive means; and,



d. said optical electromagnetic reflective and transmittive means having no appreciable absorption factors of said electromagnetic wave energy.

4,355,889

APPARATUS AND METHOD FOR RESIZING ARTWORK

Richard H. Nelson, Des Moines, Iowa, assignor to Forward Graphics, Inc., Des Moines, Iowa

Filed Jun. 23, 1981, Ser. No. 276,716

Int. Cl.[3] G03B *27/32*

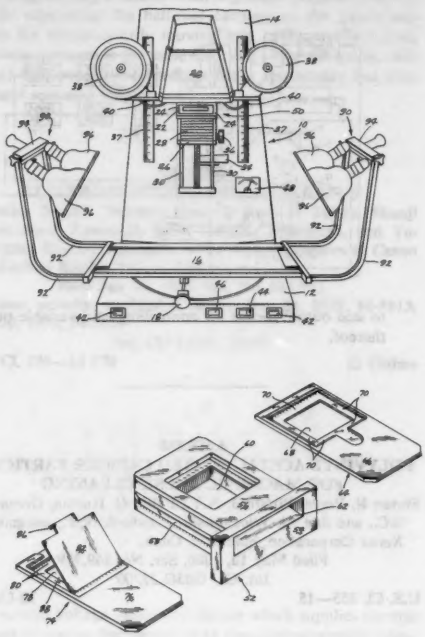
U.S. Cl. 355—39 **12 Claims**

1. In combination with a headline setter device including a copy board, a top light source directed toward said copy board, and a lens mounted for adjustable movement between said copy board and said top light source the improvement comprising:

an insert block mounted on said headline setter, and insert block including a first vertical opening disposed between said top light source and said lens, and a second horizontal opening in communication with said first vertical opening;

a selectively movable holder including a vertical aperture and means for releasably holding a projectable image focus slide in said vertical aperture, said holder being slideably insertable within said second horizontal opening such that said focus slide is disposed within said first vertical opening between said top light source and said lens, whereby the image of the focus slide is projected on said copy board and focused by adjustment of said lens;

said holder further including means for releasably holding an unexposed photographic film in said vertical aperture, and an opaque flap disposed to cover said unexposed film, said holder being slideably insertable within said second horizontal opening such that said unexposed film is disposed within said first vertical opening between said opaque flap and said lens; and



a base light disposed to illuminate an art work image disposed on said copy board and to expose said unexposed film to said illuminated art work image.

4,355,890

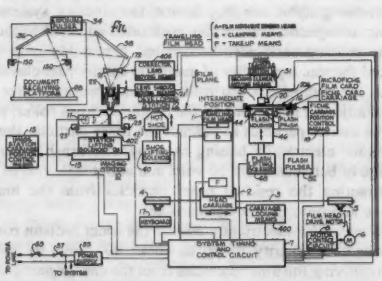
MICROFICHE RECORDING SYSTEM

Peter H. Klose, Troy, and Herbert C. Ovshinsky, Oak Park, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Jan. 23, 1981, Ser. No. 227,959

Int. Cl.[3] G03B *27/44, 27/62, 27/64*

U.S. Cl. 355—54 **16 Claims**



1. In a microfiche film recording system including moveable supporting means for supporting an intermediate film strip, film advancing means for advancing a selected area of said film strip into an imaging position thereon, carriage means for moving said supporting means between an imaging station including imaging light projecting means including an optical train for forming an image on a selected area of said film strip

in a given imaging plane and an image transfer station including image transfer means for transferring the image on said selected area in a given transfer plane to a microfiche photographic film having a selected frame upon which said image is to be transferred, the improvement comprising a first pressure applying means at said imaging station which engages one side of the intermediate film strip at the imaging station and bows the same into said imaging plane against a backing member at said plane, a second pressure applying means at said image transfer station which engages the other side of the intermediate film strip thereat and bows the same in the opposite direction against said microfiche film backed by a backing member thereat, said backed microfiche film establishing said transfer plane, an illumination means moveable opposte said imaging station for projecting the image on a selected frame of said microfiche film backward through said optical train, said illumination means having a planar output window, additional means for moving said intermediate film strip supporting means and the strip carried thereby away from said imaging station and said illumination means opposite said imaging station, a common moving means for said first pressure applying means and said illumination means for moving the same toward and away from said imaging plane, said illumination means output window being disposed against the selected frame of said microfiche film when said additional means is operative to move said illumination means opposite said imaging station and said common moving means has moved said illumination means to a point closest to said imaging plane.

4,355,891

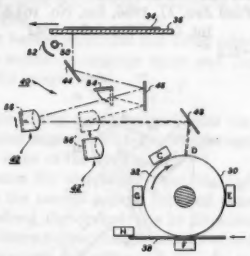
REDUCTION OF LAMP STROBING EFFECTS IN A REPRODUCING APPARATUS

David L. Cole, Fairport; Gregory B. Swistak, Webster; Randall C. Ryon, Fairport; William L. Lama, Webster, and Karl A. Northrup, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 127,685, Mar. 6, 1980. This application Jul. 2, 1980, Ser. No. 165,177

Int. Cl.³ G03B *27/34, 27/40, 27/70*

U.S. Cl. 355—57 **17 Claims**



1. In an apparatus including an optical system for strip-wise viewing a document to be reproduced and for projecting an image thereof onto a recording surface, said optical system having a process speed V and including a light source having a fundamental frequency f_0 which illuminates the document and at least one reflector element having an elongated illumination slit integral with said reflector, said reflector element located at a distance from said recording surface, such that the strobing effects of said light source on said recording surface are minimized.

4,355,892

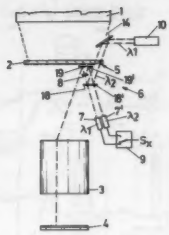
METHOD FOR THE PROJECTION PRINTING

Herbert E. Mayer, and Ernst W. Loebach, both of Eschen, Liechtenstein, assignors to Censor Patent- Und Versuchs-Anstalt, Vaduz, Liechtenstein

Filed Dec. 18, 1980, Ser. No. 217,787

Int. Cl.³ G03B *27/32*

U.S. Cl. 355—77 **5 Claims**



1. A method for the projection printing of masks onto a workpiece, particularly onto a wafer for the manufacture of integrated circuits, in which the pattern of said mask is imaged onto a photosensitive layer coating said workpiece by means of an exposure light directed through a projection lens, prior to said projection printing aligning relative to each other said mask and said workpiece, which has already been marked, by imaging into each other corresponding alignment marks of said mask and alignment patterns of said workpiece by means of alignment light reflected from said workpiece, said alignment light comprising at least two narrow wavelength ranges spaced from each other on the wavelength scale, in said ranges said photosensitive layer of said workpiece being non-sensitive or low-sensitive, determining the intensity of said alignment light reflected from said workpiece and generating an alignment signal from the wavelength range of said alignment light having highest intensity.

4,355,893

EYE-SAFE LASER CLOUD HEIGHT RANGEFINDER

Evan P. Chicklis, Nashua, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Sep. 8, 1980, Ser. No. 184,850

Int. Cl.³ G01C *3/08;* H01S *3/00*

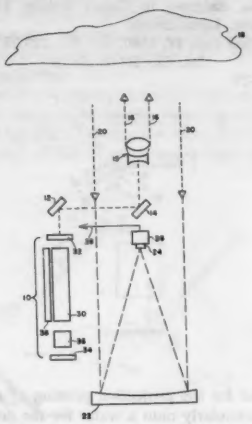
U.S. Cl. 356—4 **16 Claims**

8. A method of determining cloud height, comprising the steps of:

providing a Er:$LiYF_4$ laser which outputs coherent radiation at 1.73 micrometers and prevents oscillations at 0.85 micrometers and 1.23 micrometers;

transmitting said radiation toward clouds;

providing a detector which is responsive to said 1.73 micrometers radiation; and



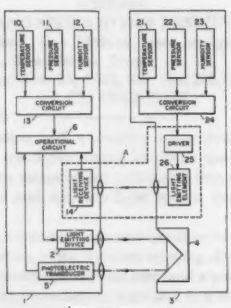
receiving reflected radiation from said clouds at said detector.

4,355,894

METHOD AND APPARATUS FOR CORRECTING FOR METEOROLOGICAL ERROR IN DISTANCE MEASUREMENTS USING LIGHT WAVES

Masaru Maeda, Kawasaki, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Filed Jul. 16, 1980, Ser. No. 169,377
Claims priority, application Japan, Jul. 26, 1979, 54-94243
Int. Cl.³ G01C *3/08*
U.S. Cl. 356—5 **23 Claims**



1. In light wave distance measuring apparatus for measuring the distance between spaced locations and for providing an output indicating the result of the measurement, the improvement comprising:

means for automatically measuring the prevailing meteorological conditions at each of said spaced locations simultaneously with the measurement of said distance; and

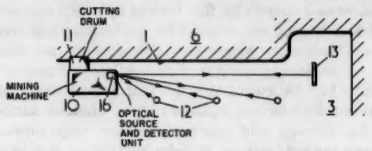
means responsive to the measuring means for automatically correcting the distance measurement to eliminate error due to variations in said meteorological conditions from predetermined meteorological conditions.

4,355,895

SURVEY SYSTEMS

Angus H. Cairns; Nicholas J. Houston, both of Camberley, and Noel W. F. Stephens, Yateley, all of England, assignors to Coal Industry (Patents) Limited, London, England

Continuation of Ser. No. 61,101, Jul. 26, 1979, abandoned, which is a continuation of Ser. No. 885,221, Mar. 10, 1978, abandoned.
This application Feb. 9, 1981, Ser. No. 232,761
Int. Cl.³ G01B *11/26;* E01B *35/02*
U.S. Cl. 356—141 **13 Claims**



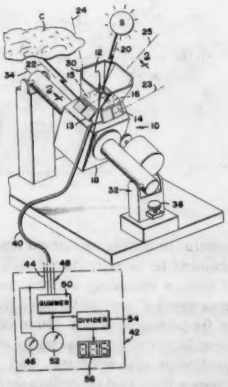
1. A survey system comprising a mobile optical receiver adapted to travel a fixed path, a series of optical sources positioned in a line generally along said path, the receiver having sensor array means for substantially simultaneously receiving light from a predetermined minimum group of sources within the series of sources, the sensor array means being responsive to light projected by the group of optical sources visible to the receiver to determine the angle of incidence of the light projected from each visible source of the group relative to an optical axis of the receiver, the system having means for periodically electronically scanning the sensor array means to detect light impinging upon the sensor array means for effecting such source angle determinations periodically, the period of said scanning means being such that a pluraity of angle determinations are made on each group of sources visible to the receiver, the system further including processing circuitry adapted to correlate the angular measurements and to derive therefrom information identifying the shape of said fixed path.

4,355,896

CLOUD COVER SENSOR

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Eric G. Laue, San Marino, Calif.

Filed Jun. 27, 1980, Ser. No. 163,837
Int. Cl.³ G01J *1/26, 1/42*
U.S. Cl. 356—222 **10 Claims**



1. Cloud cover detector apparatus comprising:

a frame which has a predetermined axis that can extend towards the sun;

a plurality of indirect sensors, which sensors generate outputs dependent upon the amount of sunlight incident thereon, mounted on said frame to face along lines which are angled by less than 90° from said axis and are also angled from one another so as to extend in different directions;

shield means mounted on said frame, for shielding each of said indirect sensors from direct sunlight when said frame is oriented so that said axis extends towards the sun; and

means responsive to the output of said indirect sensors for indicating the cloudiness of the sky.

4,355,897

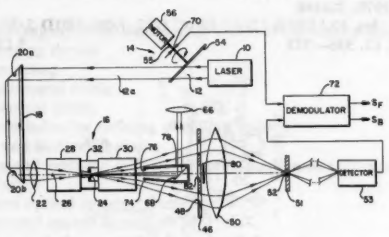
NEAR-SIMULTANEOUS MEASUREMENTS AT FORWARD AND BACK SCATTER ANGLES IN LIGHT SCATTERING PHOTOMETERS

Wilbur I. Kaye, Corona Del Mar, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 864,991, Dec. 27, 1977, abandoned. This application Jun. 9, 1980, Ser. No. 157,598

Int. Cl.³ G01N *21/01, 21/49, 21/85*

U.S. Cl. 356—338 **6 Claims**



1. A light scattering photometer comprising:

a source of light;

a sample zone having an optical axis along which light from the source passes to impinge upon and scatter from a sample in the sample zone;

a detector;

means for intercepting light scattered from the sample at a predetermined angle θ with respect to the optical axis and for passing same to the detector;

switching means for alternately directing light from the source into the sample zone in first and second opposite directions along the optical axis to illuminate a sample therein in alternate succession and in near-simultaneity from said opposite directions such that for light directed into the sample zone in said first direction the intercepting means intercepts forward scatter from the sample at said angle θ while for light directed into the sample zone in said second direction the intercepting means intercepts back scatter from the sample at an angle $180°-\theta$, the intercepting means passing said forward scatter and said back scatter in alternate succession and in near-simultaneity to the detector; and

demodulation means synchronized with the alternation of said switching means for demodulating the output of said detector to derive near-simultaneous forward and back scatter measurements from the sample.

4,355,898

OPTICAL DETECTING, MONITORING OR MEASURING ARRANGEMENTS

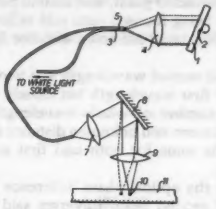
John P. Dakin, Southampton, England, assignor to Plessey Overseas Limited, Ilford, England

Filed May 23, 1980, Ser. No. 152,714

Claims priority, application United Kingdom, May 23, 1979, 7918056

Int. Cl.³ G01B *9/02*

U.S. Cl. 356—346 **3 Claims**



1. An optical detecting, monitoring or measuring arrangement comprising a movable diffraction grating arranged to have a beam of white light incident thereon and arranged for angular displacement by means responsive to changes in one or more parameters whereby the colour of light being reflected to a light receiving point from said grating changes and said light is then directed onto a fixed diffraction grating so that the direction of a light beam consequentially reflected from said fixed diffraction grating changes with change in colour, said change in direction being dependent upon and providing an indication of the change in said parameter or parameters.

4,355,899

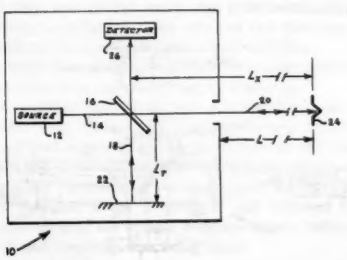
INTERFEROMETRIC DISTANCE MEASUREMENT METHOD

Thomas A. Nussmeier, Thousand Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 22, 1980, Ser. No. 152,232

Int. Cl.³ G01B *9/02*

U.S. Cl. 356—349 **6 Claims**



6. A method for determining the distance between a first preselected point and a second point comprising the steps of:

(a) providing a first beam of electromagnetic radiation at a first optical wavelength;

(b) splitting said first beam at said first preselected point into a beam following a first path and a beam following a second path, said first path beam being focused onto a first reflective surface a known distance from said preselected point, said second path beam being focused onto a reflective surface at said second point an unknown distance from said preselected point;

(c) determining an optical phase difference of said first beam as said first beam traverses said first path said known distance from said preselected point and said second path said unknown distance from said preselected point;

(d) replacing said first beam with at least a second beam of electromagnetic radiation at a second optical wavelength, said second beam following the same optical path as said first beam such that said second beam is split into a beam following said first path and a beam following said second path, said first path beam of said second beam being focused onto said first reflective surface said known distance from said preselected point, said second path beam of said second beam being focused onto said reflective surface at said second point said unknown distance from said preselected point;

(e) selecting said second wavelength at a wavelength different than said first wavelength but closely spaced thereto such that a number of whole wavelengths in the path difference between said unknown distance and said known distance is the same for both said first and said second wavelengths;

(f) determining the optical phase difference of said second beam as said second beam traverses said first path said known distance from said preselected point and said second path said unknown distance from said preselected point;

(g) utilizing said optical phase difference of said first beam, said optical phase difference of said second beam, said first wavelength and said second wavelength to establish said number of whole wavelengths in said path difference between said unknown distance and said known distance;

(h) combining said number of whole wavelengths with said optical phase difference of said first beam and said first wavelength in order to establish said path difference between said unknown distance and said known distance; and

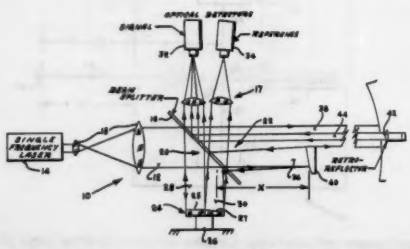
(i) determining said unknown distance between said first preselected point and said second point by combining said known distance with said path difference between said unknown distance and said known distance.

4,355,900

SELF-CALIBRATING INTERFEROMETER

Thomas A. Nussmeier, Thousand Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 8, 1980, Ser. No. 176,435
Int. Cl.³ G01B *11/02*
U.S. Cl. 356—356 **10 Claims**



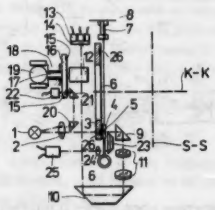
1. A self-calibrating interferometer comprising: means for providing a first beam of electromagnetic radiation, beam splitting means optically aligned with said electromagnetic beam for splitting said beam into a first path beam and a second path beam; first means optically aligned with the first path beam for dividing said first path beam into a first portion beam and a second portion beam and for reflecting said first portion beam and said second portion beam of said first path beam therefrom; distance altering means, operably connected to said first means, for altering the distance of said first means from said beamsplitting means; second means, located a preselected distance from said beamsplitting means and optically aligned in said second path beam, for dividing said second path beam into a first portion beam and a second portion beam and for reflecting said first portion beam of said second path beam therefrom; means located an unknown distance from said beamsplitting means and optically aligned in said second path beam for reflecting said second portion beam of said second path beam therefrom; first detecting means optically aligned with said reflected first portion beam of said first path beam and said second portion beam of said second path beam for detecting said first portion beam of said first path beam and said second portion beam of said second path beam and producing an output in accordance therewith; second detecting means optically aligned with said second portion beam of said first path beam and said first portion beam of said second path beam for detecting said second portion beam of said first path beam and said first portion beam of said second path beam and producing an output in accordance therewith; and comparing means operably connected to said first detecting means and said second detecting means for comparing said outputs received therefrom.

4,355,901

ARRANGEMENT FOR MEASURING THE POSITION OF AN INDEX

Wieland Feist, 6, Erfurter-Strasse, and Franz Kebschull, 8, Str. der Kosmonauten, both of Jena, District of Gera, German Democratic Rep.

Filed Sep. 30, 1980, Ser. No. 192,183
Claims priority, application German Democratic Rep., Oct. 10, 1979, 216146
Int. Cl.³ G01B *11/14*; G01C *1/02, 1/06*; G01D *5/36*
U.S. Cl. 356—373 **3 Claims**



1. Arrangement for the repeated measuring of the position of an oscillating index comprising:

a graduated circle seated for rotation,

said index for determining the reading position of said graduated circle,

a first imaging system,

a plano-parallel plate,

a first photodetector,

said reading position, said first imaging system,

said plano-parallel plate and said first photodetector being in optical alignment,

said reading position being substantially arranged in the object side focal plane of said first imaging system,

a pendulum,

said index being secured to said pendulum,

a servo-motor,

an axle being secured to said servo-motor for rotating said plano-parallel plate mechanically connected to said axle,

an interpolator being connected to said axle,

a second imaging system,

a second photodetector,

said index, said second imaging system and said second photodetector being in optical alignment,

said second imaging system being for imaging said index onto said second photodetector

the latter being for detecting the oscillation frequency of said index, and

electronic means for control of said servo-motor rotation frequency,

said electronic means being arranged between said second photodetector and said servo-motor.

4,355,902

ARRANGEMENT FOR DETERMINING THE ERRORS THE VERTICAL AXIS OF A SURVEYING DEVICE

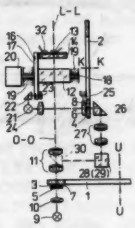
Wieland Feist, 6, Erfurter Strasse, Jena, District of Gera, German Democratic Rep.

Filed Sep. 30, 1980, Ser. No. 188,841

Claims priority, application German Democratic Rep., Oct. 1, 1979, 215908

Int. Cl.³ G01B *11/14*; G01C *1/02, 1/06*; G01D *3/04*

U.S. Cl. 356—375 **1 Claim**



1. Arrangement for determining errors of the vertical axis of a surveying device

comprising

a horizontal circle,

a vertical circle,

a first index for defining a reading portion on said horizontal circle,

a second index for defining a reading portion on said vertical circle,

a first optical system,

a second optical system,

an optical plano-parallel plate seated for rotation,

a servo-motor mechanically connected to said plano-parallel plate,

a first photodetector for said reading portion on said horizontal circle,

a second photodetector for said first index,

a third photodetector for said reading portion on said vertical circle,

a fourth photodetector for said second index,

said reading portion on said horizontal circle, said first index, said first optical system, said plano-parallel plate, said first and second photodetector being in optical alignment,

said first optical system being for imaging said reading portion on said horizontal circle and said first index into a plane defined by said first and said second photodetector,

said reading portion on said vertical circle, said second index, said second optical system, said plano-parallel plate, said third and fourth photodetector being in optical alignment,

said second optical system being for imaging said reading portion on said vertical circle and said second index into a plane defined by said third and fourth photodetector,

an interpolation unit including a fifth photodetector,

being connected to said plano-parallel plate,

said fifth photodetector being for producing an interpolation pulse sequence in dependence on the rotations of said plano-parallel plate,

a gate circuit,

a counter being connected to said fifth photodetector via said gate circuit,

said second and fourth photodetector being connected to said gate circuit and alternatingly producing ON-pulses and OFF-pulses for said gate circuit,

said counter being for counting the intepolation pulses between said ON and OFF pulses,

a computer being connected to said counter and to said first and said third photodetector for computing a corrected reading, a display unit for displaying the corrected reading,

said display unit being connected to said computer.

4,355,903

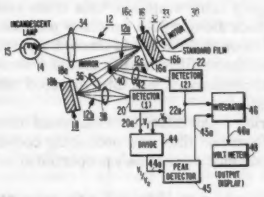
THIN FILM THICKNESS MONITOR

John R. Sandercock, Zurich, Switzerland, assignor to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 119,968, Feb. 8, 1980, abandoned. This application Aug. 28, 1980, Ser. No. 181,990

Int. Cl.³ G01B *11/02*

U.S. Cl. 356—382 **11 Claims**



1. A thin film thickness monitor comprising:

a source of light for a light having a plurality of wavelengths;

a light detector for generating an output signal indicative of detected light;

a reference thin film of varying thickness having a known optical thickness $n_i t_i$ that varies with the thickness of said film, where n_i is the refractive index of said film and t_i is the thickness at a particular portion of said film;

a specimen thin film of unknown optical thickness $n_f t_f$ where n_f is the refractive index and t_f is the thickness;

means for scanning light from said source in either successive order over the surface of said reference film, and reflecting said scanned light to the surface of said specimen film and thence to said detector, the output signal of said detector representing the intensity of said reflected light, a variation in the intensity of said reflected light being indicative of the optical thickness of said reference film and said specimen film being equal;

said reference thin film comprising a semi-circular member supported on a circular disc, whereby a semi-circular surface portion of said disc adjacent said member is scanned by said light, the thickness of said member varying circumferentially linearly between a minimum thickness and a maximum thickness; and further including:

means responsive to said output signal for determining the optical thickness of said film as a function of the scanning time or distance between either the minimum thickness or maximum thickness of the member and the thickness of the member at which the variation in the reflected light intensity occurs.

4,355,904

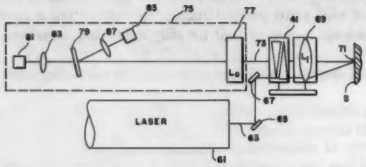
OPTICAL INSPECTION DEVICE FOR MEASURING DEPTHWISE VARIATIONS FROM A FOCAL PLANE

N. Balasubramanian, 20361 Chalet La., Saratoga, Calif. 95070

Continuation-in-part of Ser. No. 945,628, Sep. 25, 1978, Pat. No. 4,204,772. This application Apr. 14, 1980, Ser. No. 140,417

Int. Cl.³ G01C 3/00

U.S. Cl. 356—376 10 Claims



1. An optical method for measuring fine depth variations of a test surface relative to a focal plane comprising,

(a) passing a forwardly directed, collimated light beam through a beam focusing lens having an optical axis and a focal plane generally coinciding with a test surface having depthwise variations to be measured, said light beam aimed at said test surface in a direction parallel to and displaced from the optical axis of the lens so that said collimated beam is focused to a spot on the test surface coinciding with the point of intersection of the optical axis of said lens with said focal plane,

(b) re-imaging retro scattered light from said test surface passing back along a path generally parallel to the optical axis and through the lens and through a partially reflective and transmissive filter having spatially variable reflectivity and transmissivity, said filter disposed transverse to the optical axis,

(c) measuring light intensity transmitted through and reflected from said filter and producing corresponding first and second electrical signals proportional to the measurements,

(d) computing a centroid value for the retro beam using said first and second electrical signals, and

(e) relating the computed centroid value to a depthwise deviation of the beam from said focal plane.

4,355,905

ADJUSTABLE PLUG SEAL MECHANISM FOR HEAT TRANSFER ZONE SEPARATION IN HOLLOW SCREWS FOR EXTRUSION MACHINES

Harold E. St. Louis, and Walter A. Trumbull, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 24, 1980, Ser. No. 133,087

Int. Cl.³ B01F 7/08; B28C 1/16; B29B 1/04

U.S. Cl. 366—79 12 Claims

1. A cooperative assembly combination for ameliorated extrusion processing of resinous thermoplastic material comprising in a screw extruder apparatus:

(i) a barrel;

(ii) said barrel (i) having a first rearward end (A) and a second forward end (B);

(iii) means to provide a feed supply of thermoplastic resinous material to be processed to said first end (A) of said barrel (i);

(iv) means to discharge heat plastified thermoplastic resinous material from said second end (B) of said barrel (i);

(v) a hollow screw disposed within said barrel (i) and adapted to forward heat-plastified thermoplastic resinous material from said first end (A) to said second end (B) of said barrel (i), said screw containing and defining

(vi) a longitudinally-extending internal cavity having a generally cylindrical configuration;

(vii) a plug within the internal cavity (vi) adapted to divide said cavity in confined, separated fashion into

(viii) at least one heat-exchanging zone; with

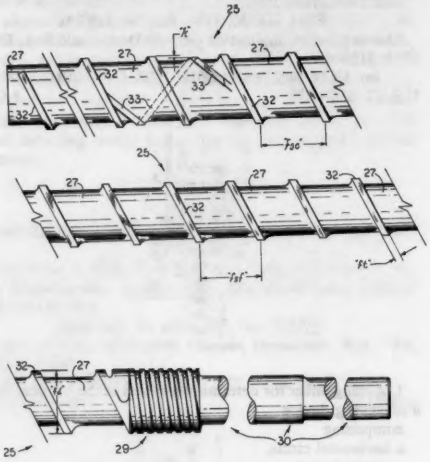
said heat-exchanging zone (viii) being disposed between said first end (A) and said second end (B) of said barrel (i) and having heat-exchanging fluid inlet and outlet conduits in operative connection with said heat-exchanging zone (viii) within said screw (E);

(ix) means for supplying and shutting off the supply of and venting a desired heat-exchanging fluid under pressure and at a selected wanted temperature into and out of said first heat-exchanging zone (h); plus

the combined cooperative improvement comprised of:

(x) an expansible plug seal mechanism adapted to be fit and moved within said cavity (vi) of said screw (v),

said plug seal (x) having therein included at least one incompletely-enclosed and at least relatively cup-like member (xi) that is of a form and configuration which is so constructed and arranged with a centrally-contained interior void space therein as to be characterized in being:



resiliently deformable and flarable laterally outwardly activated when subject to and spreadingly urged by heat-exchange fluid under pressure when same is present centrally within said cup-like member (xi); whereby the outer circumferential exterior surface(s) of each of said cup-like members (xi) are pressed against and in conforming sealing engagement with the internal wall surfaces of said cavity (vi) within the screw (v);

thus preventing substantial passage of heat-exchange fluid under pressure past or about the so-engaged and activated plug seal (x).

4,355,906

STIRRING APPARATUS FOR CELL CULTURE

K. Ray Ono, Bridgeton, N.J., assignor to Bellco Glass Inc., Vineland, N.J.

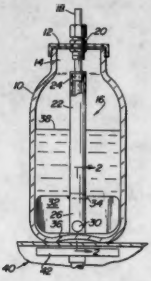
Filed Apr. 3, 1981, Ser. No. 250,773

Int. Cl.³ B01F 13/08

U.S. Cl. 366—274 8 Claims

1. Apparatus for use in cell culture comprising a vessel of non-magnetic material, said vessel having an inlet opening whose diameter is less than the diameter of the vessel, a stirring assembly insertable into the vessel through said opening for stirring the contents of the vessel, said assembly including a stirring member for rotating the assembly in response to magnetic forces, said assembly including an elongated holder having a slot at its lower end, first and second blades in said slot, said blades having a combined length which is greater than the diameter of said opening, said stirring member extending

through a hole in said blades, said blades being mounted for pivotable movement downwardly about the longitudinal axis



of said stirring member, said stirring member being generally perpendicular to said axis of said holder and being encapsulated in an inert sterilizable material.

4,355,907

APPARATUS FOR PICKING UP A MOLTEN TEST SAMPLE OF METAL OR METAL ALLOYS AND MEASURING THE COOLING CURVE OF SAID SAMPLE

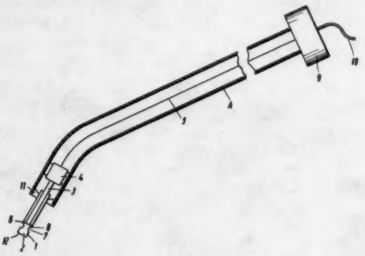
Kurt Orths, Ratingen; Milan Lampic, Marburg; Peter Berger, Düsseldorf-Benrath; Jörg Müller, Düsseldorf-Wersten, and Herbert Löblich, Hilden, all of Fed. Rep. of Germany, assignors to Verein zur Förderung der Giesserei-Industrie, Düsseldorf, Fed. Rep. of Germany

Filed Jul. 10, 1980, Ser. No. 168,451

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1979, 2929693

Int. Cl.³ G01J *5/08*

U.S. Cl. 374—26 **10 Claims**



1. In apparatus for picking up a test sample of molten metal or metal alloys and measuring the cooling curve of said sample, comprising a sample receptor and a optical conductor leading from the receptor to a transducer, the improvement comprising:

(a) a lance;

(b) the receptor being a small, open ended refractory tube having a cavity for receiving the molten sample arranged at the free extremity of said lance;

(c) the optical conductor contained within said lance and terminating at said cavity in said receptor;

(d) a barrier disposed between said cavity and said optical conductor, said barrier consisting of a heat resistant, highly thermally conductive material of such quality as to cause the material of the melt sample which is picked up to adhere thereto.

4,355,908

DEVICE FOR MEASURING THE MASS FLOW AND THE HEAT FLOW AND METHOD FOR DETERMINING THE MASS FLOW

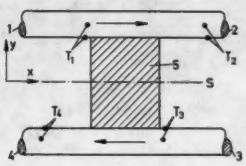
Günter Weisser; Bernd Starkloff, both of Bad Homburg von der Hohe, and Klaus Stoesser, Hofheim, all of Fed. Rep. of Germany, assignors to Battelle-Institut e.V., Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 15, 1980, Ser. No. 122,066

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1979, 2906186; Nov. 6, 1979, 2944707

Int. Cl.³ G01K *17/08*

U.S. Cl. 374—39 **24 Claims**



1. Device for measuring the mass flow and the heat flow of fluid in a fluid conveying system that is connected to means which consumes heat from or provides heat to such fluid flow, which consists essentially of (i) two fluid-carrying lines, one line being the fluid feed line and the other being the fluid return line, (ii) a heat-conducting section positioned between the two fluid-carrying lines, at least a cross-sectional portion of said heat-conducting section which is transverse to the heat flow path through said heat-conducting section consisting essentially of a material of low-thermal conductivity, fluid-solid interfaces being formed between the fluid in the feed line and the heat-conducting section and between the fluid in the return line and the heat-conducting section, such two interfaces forming two heat transfer zones, and the heat-conditioning section have heat transmission properties such that the heat-conducting section has a thermal impedance which is relatively higher than the thermal impedance of each of the two interfaces between the fluid and the heat-conducting section, and (iii) at least one temperature sensor located in each of the two fluid-carrying lines immediately at or close to an edge of an end of the heat-conducting section, one of the fluid carrying lines having two temperature sensors located therein, one of such two temperature sensors being located upstream and the other of such two temperature sensors being located downstream of the appropriate end of the heat-conducting section, the temperature differentials between at least two pairs of such temperature sensors providing a measurement of the mass flow and the heat flow of the fluid.

4,355,909

TEMPERATURE MEASUREMENT BY MEANS OF HEAT TUBES

Hans B. Knudsen, Copenhagen, Denmark, assignor to F. L. Smidth & Co., Cresskill, N.J.

Filed May 19, 1980, Ser. No. 150,807

Claims priority, application United Kingdom, May 22, 1979, 7917694

Int. Cl.³ G01K *1/16*

U.S. Cl. 374—135 **16 Claims**

1. A method for measuring the temperature of hot fluids, particularly in environments involving thermal radiation, comprising:

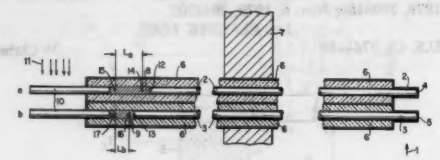
(1) taking a temperature measuring device having at least two measuring bodies, each measuring body being capable of maintaining a substantially uniform temperature over its length;

(2) protecting said measuring bodies against heat transfer by radiation;

(3) positioning said measuring bodies in the hot fluid environment;

(4) maintaining said radiation-protected measuring bodies at substantially constant, differing temperatures, which temperatures are below the temperature of the hot fluid and are generally uniform over the lengths of said measuring bodies;

(5) calculating the temperature of the hot fluid by:



(a) dividing the heat emission to each radiation-protected measuring body by the product of (1) the heat transfer coefficient of the heat transfer between the hot fluid and said body and (2) the surface area of the respective measuring body, and then,

(b) adding to that value the temperature of the respective measuring body,

whereby it is unnecessary to heat said measuring body to the temperature of the hot fluid.

4,355,910

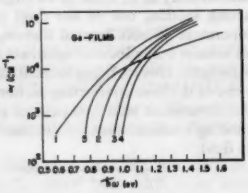
METHOD AND APPARATUS FOR AN OPTICAL SENSOR UTILIZING SEMICONDUCTOR FILTERS

William H. Quick, La Habra Heights; Kenneth A. James, Corona Del Mar, and Virgil H. Strahan, Orange, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 5,532, Jan. 22, 1979, abandoned. This application Apr. 7, 1980, Ser. No. 138,059

Int. Cl.³ G01L *7/00*; G01K *5/62*

U.S. Cl. 374—162 **10 Claims**



1. An apparatus for sensing the status of a physical parameter, said apparatus comprising:

means for positioning a light source in response to said physical parameter, and

a graded optical filter comprising a variable band gap semiconductor material and including a plurality of contiguous regions that are positioned to receive light transmitted from the source thereof,

each of said regions having respective absorption edge wavelength cutoff characteristics that vary as a function of the position of the light source relative to such regions through which light is transmitted and that differ from the absorption edge wavelength cutoff characteristics of regions to which it is contiguous,

whereby the light being transmitted through said regions is indicative of the physical parameter and the status thereof which is to be sensed.

4,355,911

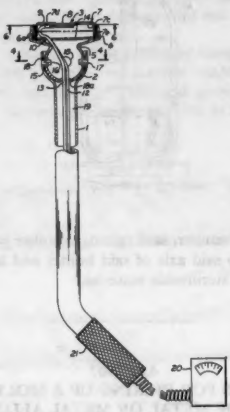
SURFACE TEMPERATURE SENSING DEVICE

John Tymkewicz, c/o Marlin Manufacturing Corp., 12404 Triskett Rd., Cleveland, Ohio 44111

Filed Sep. 9, 1980, Ser. No. 185,508

Int. Cl.³ G01K *1/16, 7/04*

U.S. Cl. 374—165 **8 Claims**



1. A temperature sensing probe device comprising an arm having a socket at one end, a probe head member including a ball-like element mounted in said socket for limited universal movement, a contact section having a portion insulated from the ball-like element connected to the ball-like element and comprising the extremity of the head member, said contact section being positioned for engagement with an area where temperature is to be sensed by movement of said arm, and thermocouple leads connected to the contact section and extending through the arm to indicating means, the ball-like element and contact section being formed of relatively thin material to minimize the mass thereof and facilitate rapid temperature change response transmittal from the head member to the indicating means.

4,355,912

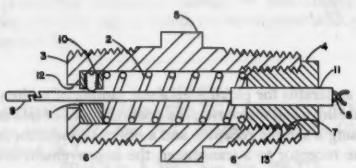
SPRING LOADED SENSOR FITTING

Raymond L. Haak, Rte. 3, Box 293, Alta Loma, Tex. 77510

Filed Sep. 12, 1980, Ser. No. 186,549

Int. Cl.³ G01K *1/14*

U.S. Cl. 374—208 **4 Claims**



1. An improved spring-loaded apparatus for use with a heat sensor and in combination with isolating or thermal wells comprising:

a double ended male threaded body for attaching to an internally threaded conduit member, said threaded body having an internally bored hole with female threads on one end;

a cylindrical member located within said internally bored hole in said threaded body, said cylindrical member having adjustable means for selectively rigidly attaching said cylindrical member to said heat sensor at different positions along the length of said sensor;

an internal compression spring having outside diameter less than the diameter of said internally bored hole in said threaded body, said spring positioned within said threaded body so as to exert a force on said cylindrical member;

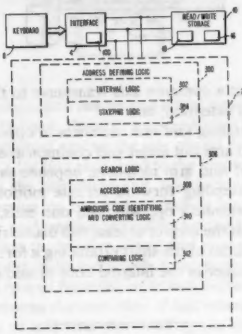
a retaining threaded member having external threads on one end, said external threads mating with said female threads on said threaded body.

4,355,913

CONTENT-ADDRESSED TEXT SEARCH APPARATUS FOR TYPEWRITERS

Edward V. Rutkowski, Jr., Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 27, 1979, Ser. No. 79,414
Int. Cl.³ B41J 5/30
U.S. Cl. 400—63 **10 Claims**



1. For use in a keyboard activated printing apparatus having a text storage for storing strings of text representative codes, said codes being related to actuations of a keyboard apparatus and including at least one set of plural codes that correspond to an apparently similar printing operation as regards a printed document, a text search system comprising:

operator actuatable means for indicating an interval when an address string of codes from said keyboard apparatus is to be recognized;

means, responsive to said indicating means, for storage, as an address code string, codes generated during said interval;

and search logic means for identifying an addressed location in said text storage, said search logic means including means for sequentially accessing codes from said text storage, means for comparing said text storage codes to said text address code string, said comparing means including means for identifying codes that are members of said set in said text string and in said address string and for converting said set codes, for comparison purposes, to a predefined common code for the set, whereby a location for stored text, that is apparently similar to the address text string from a document appearance standpoint, is indentified.

4,355,914

ACOUSTIC HOOD WITH GLARE SHIELD

James S. Alexander, Paris, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 1, 1980, Ser. No. 145,546
Int. Cl.³ B41J 29/08
U.S. Cl. 400—690.1 **21 Claims**

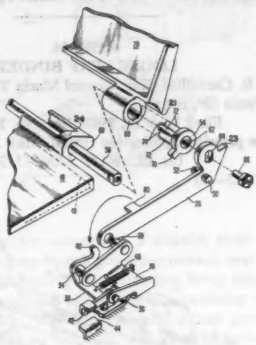
1. A sound hood for suppressing noise emanating from a typewriter of the type having an opening in the top thereof for access to the printing region of said typewriter, comprising:

a first elongate panel member with a surface substantially coextensive with said opening;

a second elongate panel member with an elongated dimension substantially coextensive with said first panel member positioned with one elongated edge of each of said panel members proximate each other;

means for mounting said first and second panel members with said first panel member proximate said opening;

pivot and friction means engageable with said first and second panel members proximate one another at said elongated edges and for pivotally mounting said panel members with respect to each other and for frictionally resisting relative movement between said panel members;



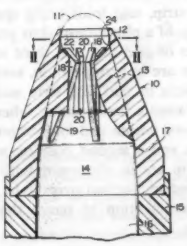
means operatively engageable with said pivot and friction means, responsive to movement of said first panel member to a position proximate said opening for raising said second panel member with respect to said first panel member to a position previously determined by said pivot and friction means, whereby said second panel member is raised to and maintained in a raised position with respect to said first panel member upon the closure of said first panel member over said opening.

4,355,915

BALL-POINT PEN TIP

Shigeru Kaji, and Seiji Noguchi, both of Soka, Japan, assignors to Pentel Kabushiki Kaisha, Japan

Filed May 25, 1979, Ser. No. 42,574
Claims priority, application Japan, May 30, 1978, 53-63857
Int. Cl.³ B43K 7/10, 1/08
U.S. Cl. 401—216 **9 Claims**



1. A ball-point pen for use with a water soluble ink comprising: a tip having a ball retainer at its axially front end which is formed with a cup-shaped recess; a ball rotatably disposed in said cup-shaped recess; an ink guide opening extending through the bottom of the recess and communicating with the rear end of the tip; and an axial sleeve having an ink chamber formed therein which communicates with the ink guide opening, the ink guide opening having a center opening and a plurality of axially and radially extending ribs projecting from the inner surface of the tip which defines the center opening,

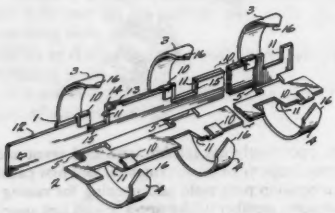
the ribs comprising a plurality of larger ribs and a plurality of smaller ribs interleaved with the larger ribs, the smaller ribs having a radial length of projection which is less than that of the larger ribs, the larger and smaller ribs both having a substantially uniform width along their axial extent, the center opening having a diameter which gradually reduces in the direction from the ink chamber toward the recess, and the plurality of ribs being configured such that the distance between adjacent ribs gradually narrows in the radial inward direction from the inner surface which defines the center opening toward the center axis of the center opening.

4,355,916

LOOSE LEAF BINDER

Claudio B. Cardellini, Rua Manuel Maria Tourinho, 673, 01236 Sao Paulo SP, Brazil

Filed May 20, 1980, Ser. No. 151,887
Claims priority, application Brazil, May 22, 1979, 7903221
Int. Cl.³ B42F *3/04, 13/20*
U.S. Cl. 402—41 **6 Claims**



1. A loose leaf binder comprising:

a pair of elongated strips each having a plurality of half rings at corresponding spaced locations along an edge thereof;

means hingedly interconnecting said strips;

means provided at the ends of said half rings to permit a half ring associated with one strip to cooperate with a half ring associated with the other strip to form a full ring when the half rings are positioned in juxtaposition;

means provided on said first strip for retaining a third elongated strip while permitting relative longitudinal movement therebetween, said third strip being interposed between the first and second strips when the half rings are in juxtaposition;

a plurality of folds provided along one longitudinal edge of said second strip, said folds being spaced to correspond with spacings of a plurality of slots provided along longitudinal edges of said first and third strip whereby when the half rings are in juxtaposition, said folds are received within the slots in said first strip and said third strip is movable between a first position wherein its longitudinal edge is received within said folds to retain the half rings in juxtaposition and a second position wherein the slots in the third strip are in alignment with the folds so as to permit the first and second strips to be pivoted about their hinged interconnection to move the half rings out of juxtaposition.

4,355,917

STARTER JAW COUPLING FASTENER

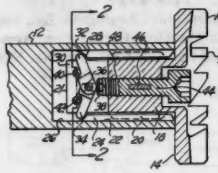
Dennen J. Bunger, Clinton, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Filed Sep. 29, 1980, Ser. No. 191,732
Int. Cl.³ F16D *1/06*
U.S. Cl. 403—24 **17 Claims**

13. A fastener for connecting a rotary member to a shaft having an internally splined bore at one end, said internally splined bore having a relief at the bottom of the bore forming a shoulder at the end of each spline adjacent to the relief, comprising:

a rotary member having an externally splined section mating with the internal splines of said bore and a cylindrical extention adapted to be received in said internally splined bore, said cylindrical extension having an arm slot disposed diametrically therethrough;

a pair of arm members disposed in said arm slot, each of said arm members having one end pivotally connected to the



other about a common axis transverse to the axis of said cylindrical extention; and

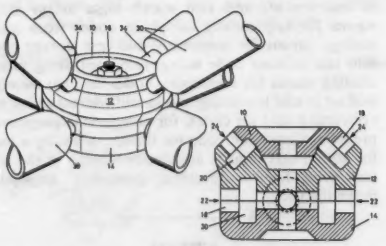
means for rotating said arm members in opposite directions within said arm slot about said common axis to produce at the ends of said arm members, opposite said one ends, a radially extending forward arcuate motion, the ends of said arm members opposite said one ends, engaging the shoulders at the ends of at least two diametrically opposite internal splines of the shaft producing a force holding said rotary member in the internal bore of said shaft.

4,355,918

SPACE FRAME CONNECTORS

Marius Van Vliet, Johannesburg, South Africa, assignor to Design Research Marketing (Proprietary) Limited, Johannesburg, South Africa

Filed Nov. 25, 1980, Ser. No. 210,357
Claims priority, application South Africa, Nov. 26, 1979, 79/6383; Feb. 29, 1980, 80/1191
Int. Cl.³ F16D *1/00, 3/00;* F16L *41/00*
U.S. Cl. 403—170 **8 Claims**



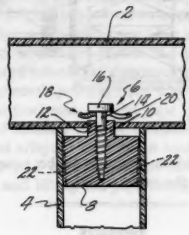
1. A space frame connector including three elements which are stacked one on the other on a common axis with the face of each element which abuts that of another including recessed formations which between the opposite element faces define sockets for trapping the headed ends of space frame members, with the axes of the sockets between a first pair of element faces lying in a common plane and those between the second pair of faces being inclined relatively to and on the same side of the plane containing the axes of the sockets between the first pair of element faces and means for clamping the elements in the direction of their common axis.

4,355,919

PIPE CONNECTION

Kari J. Lievonen, 1110 Sixth Ave. South, Lake Worth, Fla. 33460

Filed Oct. 1, 1980, Ser. No. 193,339
Int. Cl.³ F16B 7/08; F16L 41/00
U.S. Cl. 403—191 11 Claims



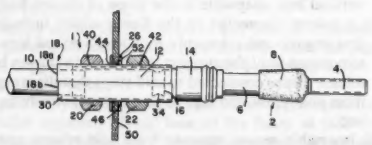
1. A pipe connection comprising a first pipe having an opening through the side thereof, a second pipe having one end contoured and fitted against the side of said first pipe and over said opening, a locking plug fixed to the interior of said second pipe adjacent the contoured end, said locking plug having a smaller projection on one end projecting into the opening in said first pipe, said smaller projection having a stem projecting from its end into the interior of said first pipe, said stem having an enlarged head on its end which is also positioned within said first pipe and spaced from the inner wall thereof, a holding clip positioned between the underside of said enlarged head and the inner surface of said first pipe holding the contoured end of said second pipe against the side of said first pipe.

4,355,920

CLAMP-TO-BULKHEAD ADAPTERS FOR PUSH PULL CABLE END FITTINGS

Dennis I. Graham, Hudson, Ohio, assignor to Incom International Inc., Pittsburgh, Pa.

Filed Oct. 23, 1980, Ser. No. 199,802
Int. Cl.³ F16B 9/00
U.S. Cl. 403—195 19 Claims



1. A clamp-to-bulkhead adapter for mounting a clamp cable assembly on a bulkhead comprising

a segmented cylindrical sleeve having an outer surface and an inner surface,

fastener receiving means on the outer surface for detachably receiving fasteners.

arcuate ridge on the inner surface for detachable registration in a pre-formed clamping groove on the clamp cable assembly, and

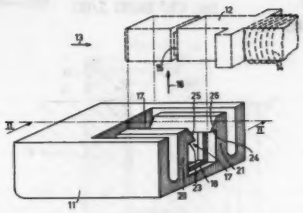
fastener means detachably receivable by the fastener receiving means for securing the sleeve about the cable assembly with the ridge in registration with the clamping groove.

4,355,921

CONTROL DEVICE COMPRISING A SLIDABLE SHAFT WITH A KNOB

Jean-Pierre Rousseau, Rambouillet, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 5, 1980, Ser. No. 204,142
Claims priority, application France, Nov. 9, 1979, 79 27697
Int. Cl.³ F16D 1/06
U.S. Cl. 403—316 2 Claims



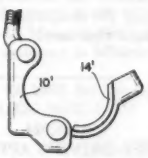
1. A control device comprising a slidable shaft having a transversely extending detent groove provided near one end, and a knob having a transversely extending fixing ridge extending into a recess provided in the knob for receiving the end of the shaft, said fixing ridge engaging said detent groove when the knob is mounted on the shaft, said knob including at least one flexible wall extending parallel to the direction in which the knob is movable when it is mounted, the flexible wall including a hook for latching the shaft into the knob and thereby securely retaining the ridge in the groove, said flexible wall being formed by a partition which is disposed in the recess.

4,355,922

METAL CLAMP FOR SCAFFOLDING, TEMPORARY BUILDING AND THE LIKE

Masataro Sato, 2-28-26, Fukuoka-machi, Takamatsu-shi, Japan

Filed Jul. 27, 1979, Ser. No. 62,234
Claims priority, application Japan, Feb. 23, 1979, 54-020342
Int. Cl.³ F16B 1/00, 7/08; E04G 7/16
U.S. Cl. 403—385 21 Claims



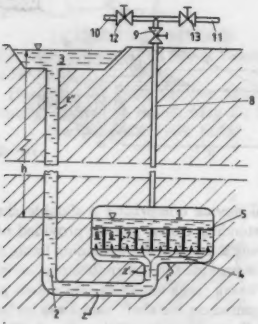
1. A clamp for pipes and similarly acting fittings, the clamp comprising a pipe carrier movably supporting a bolt and a pipe holder having an embracer for receiving the bolt and hinged to the pipe carrier, the pipe holder and pipe carrier when closed together defining a generally circular opening in which a pipe is supported, said clamp being characterized in that

said pipe holder is provided at its one end abutting said pipe carrier with a stopper means for sustaining said pipe holder at approximately a right angle to said pipe carrier to maintain the clamp open, and at its opposite end with said embracer for receiving and fixing the bolt, said embracer being directed in a radial direction of the circular opening, and said pipe carrier and the pipe holder having pipe-support, curved surfaces of different radii of curvature, whereby the clamp can supportably receive pipes of differing diameters.

4,355,923
CONSTANT PRESSURE STORAGE INSTALLATION WITH WATER SUPPLY FOR GAS TURBINE POWER PLANTS

Alfred Schwarzenbach, Wettingen, Switzerland, assignor to BBC Brown, Boveri and Company Limited, Baden, Switzerland

Filed Oct. 2, 1980, Ser. No. 193,098
Claims priority, application Switzerland, Dec. 5, 1979, 10785/79
Int. Cl.³ B65G 5/00
U.S. Cl. 405—59 **4 Claims**



1. A constant pressure air storage installation with water supply for gas turbine power plants, comprising:

a subterranean cavern for the storage of compressed air;

a compensation basin containing a water supply for compensating for the volume of air consumed from the cavern;

a riser tube for confining a water column therein and connecting the compensation basin with the cavern;

means provided for said cavern for the uniform distribution of the flow of water arising during charging and discharging of the cavern and for the compensation of the flow velocity of the water over the entire surface area of the cavern; and

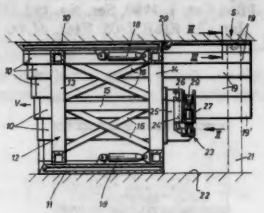
said means for the distribution and rendering essentially uniform the flow of the water being structured to render as turbulent-free as possible to-and-fro movement of the water mass between the cavern and the riser tube, to thereby minimize the danger of blow-out of the cavern water through the riser tube.

4,355,924
TUNNEL-DRIVING APPARATUS

Heinz Hüsemann, Werne, and Klaus Linde, Lunen, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Aug. 26, 1980, Ser. No. 181,505
Claims priority, application Fed. Rep. of Germany, Sep. 6, 1979, 2936067
Int. Cl.³ E01G 3/02
U.S. Cl. 405—145 **13 Claims**

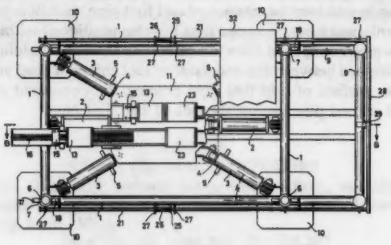
1. Apparatus for use in driving tunnels; said apparatus comprising a main forward shield composed of a plurality of elongate drive members (10, 11), frame means (12) supporting the drive members for individual longitudinal displacement, ram means (18) operable to alternately advance the drive members and the frame means to effect the driving operation, an arcuate upper rear shield (S) composed of a plurality of rear elongate extension members (19) associated with an upper group composed of some of the drive members and displaceable therewith, support means (23) mounted directly on the frame means and supportively engaging lowermost members of the rear shield, and adjustment means (27) for the support means enabling the rear shield as a whole to be raised and lowered bodily in relation to the main shield.



4,355,925
ADJUSTABLE SUPPORT FOR UNDERWATER PIPE DISTANT FROM THE SEA BED

Antonio Rognoni, Pavia, Italy, assignor to Corak Limited, London, England

Filed Feb. 4, 1981, Ser. No. 231,037
Claims priority, application Italy, Feb. 19, 1980, 20005 A/80
Int. Cl.³ F16L 1/04, 3/00
U.S. Cl. 405—172 **13 Claims**



1. In an adjustable support for underwater pipe located at a substantial distance from the sea bed, preferably greater than at least 80 cm, the improvement comprising:

(a) a frame having a base with parallel segments and intersecting portions, guide tubes at said intersecting portions, and vertical legs slidable in said tubes;

(b) support plate means attached to the lower ends of said vertical legs adaptable to the slope of the sea bed;

(c) a system connected to the frame which includes stops that engage and releasably lock said vertical legs against movement until the support is lowered to the sea bed, and release means connected to said stops that disengage them from and allow said legs to move downwardly to the sea bed;

(d) insertable means separate from said release system for engaging said vertical legs at a point spaced from said release system which allow said legs, when engaged by said insertable means, to slide only in a downward direction;

(e) a slab within the perimeter of said base frame adapted to be raised and lowered relative thereto;

(f) a pair of hydraulic jacks which are connected to their outer ends to opposing points of the parallel segments of said frame base and which extend inwardly and are connected to said slab at their inner ends, wherein said jacks are adapted to raise and lower said slab;

(g) a plurality of inclined telescopic legs for supporting said slab which are hinged at their lower ends to said corner portions of the frame and which are hinged at their upper

ends to said slab, and wherein said legs move in a telescopic manner as said jacks raise and lower said slab;

(h) means for locking said legs in their extended position when said slab is raised by said jacks;

(i) a float releasably connected to the frame which provides a positive residual weight to the support as it is lowered to the sea bed, whereupon said float is adapted to be released from the frame; and

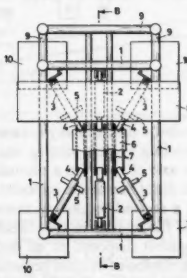
(j) a saddle system, including one-half of a saddle fixed on said slab which has a hook on its upper portion adapted to hook the pipe to be supported after the support is on the sea bed and positioned below the underwater pipe and said jacks have raised said slab toward the pipe so that said hook can releasably engage the pipe and said saddle system can support and lift the pipe to eliminate bending thereof, and another half of a saddle opposing said fixed one-half and adapted to slide on said slab under the pipe and engage and be clamped to said fixed one-half for supporting and lifting the pipe thereon.

4,355,926

ADJUSTABLE SUPPORT FOR UNDERWATER PIPE A SHORT DISTANCE FROM THE SEA BED

Antonio Rognoni, Pavia, Italy, assignor to Corak Limited, London, England

Filed Feb. 3, 1981, Ser. No. 231,112
Claims priority, application Italy, Feb. 19, 1980, 20004 A/80
Int. Cl.³ F16L *1/04, 3/00*
U.S. Cl. 405—172 **7 Claims**



1. In an adjustable support for underwater pipe located at a short distance from the sea bed, preferably at less than 80 cm, the improvement comprising:

(a) a frame having a base with parallel segments and intersecting portions resting on plate means adaptable to the slope of the sea bed;

(b) a saddle within the perimeter of said base of the frame for supporting the underwater pipe thereon when the adjustable support is on the sea bed and positioned below the underwater pipe;

(c) a pair of hydraulic jacks connected at opposing points to parallel segments of said base of the frame at their outer ends and extending inwardly and connected to said saddle at its other ends, wherein said jacks are adapted to raise and lower said saddle with said jacks raising said saddle to come into contact with the underwater pipe to support and lift it to eliminate bending thereof when the adjustable support is on the sea bed and positioned there below;

(d) a plurality of inclined telescopic legs for supporting said saddle which are hinged at their lower ends to said corner portions of the frame and which are hinged at their upper ends to said saddle, and wherein said legs move in a telescopic manner as said jacks raise and lower said saddle;

(e) means insertable in said telescopic legs for locking said legs in their extended position when said saddle has been raised by said jacks; and

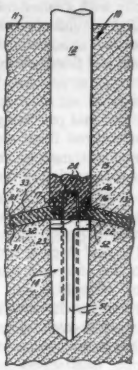
(f) a float releasably connected to the frame which provides a positive residual weight to the support as it is lowered to the sea bed, whereupon said float is adapted to be released from the frame.

4,355,927

PILING STRUCTURE AND METHODS

Karl Stephan, 7151 Dearwester Dr., Cincinnati, Ohio 45236

Filed Jul. 28, 1980, Ser. No. 173,077
Int. Cl.³ E02D *5/50, 5/54*
U.S. Cl. 405—233 **21 Claims**



1. A composite piling for use in soils and sand, said piling comprising:

a pilot means;

a disk having an aperture extending therethrough, said disk disposed on said pilot means with said aperture positioned over an upper end of said pilot means;

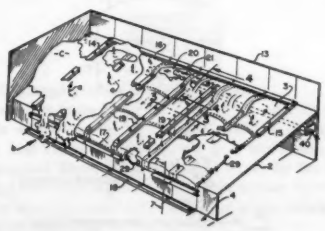
a piling member having a lower end secured to with both said disk and said pilot means for support of said piling member said pilot means having a diameter and said disk having a diameter at least about twice as great as said pilot means diameter.

4,355,928

BACKLESS AERATION PAD FOR BULK CARGO CONVEYING BARGE OR THE LIKE

William A. Zans, St. Louis, Mo., and Edward F. Vander Meulen, Downers Grove, Ill., assignors to Missouri Portland Cement Co., St. Louis, Mo.

Filed May 22, 1980, Ser. No. 152,345
Int. Cl.³ B65G *53/22*
U.S. Cl. 406—90 **7 Claims**



1. A backless aeration pad structure for a bulk cargo conveying barge, railroad car, or similar transporter, and for use in transferring and unloading granular materials such as cement or the like, comprising, a structured floor provided within the barge and being inclined towards the location of a lower floor

trough, a singular layered aeration pad provided upon said floor and for furnishing substantial coverage thereon, air supplying means provided on said floor for delivering air under pressure intermediate to said floor and its aeration pad, said structured floor being substantially air impervious, the aeration pad formed to provide passage of the pressurized air therethrough for effecting air induced movement of the cementious or other material located thereon towards the flow trough, said aeration pad being formed of a cloth material having miniscule openings therethrough for allowing passage of the pressurized air from the spacing intermediate said pad and the structured floor, means provided around the perimeter of said pad for providing it substantially with a raised margin, perimeter channel means also provided around the margin of said pad and being fixed to said floor and straddling the pad raised portions to reasonably locate said pad fixedly in place to said floor, said pad in cooperation with the structured floor defining segmentally divided and elongated air chambers over a substantial portion of the pads height, said pad being additionally secured contiguously to the structured floor along intermediate and pad division lines that create narrow and interconnected air chambers over a substantial portion of the pads height, the area between adjacent air chambers providing lines of pad division, pad reinforcing means provided upon said lines of pad division, divisional channel means provided upon said pad reinforcing means and being fixed to said floor to secure and delineate the said aeration pad into the aforesaid integrally elongated air chambers, said division channel means sealing said aeration pad at its lines of division to the said structured floor, that portion of the pads height above the upper ends of the divisional channel means but below the upper disposed perimeter channel means remaining unattached to the structured floor therebeneath and capable of forming a space intermediate to the aeration pad and the structured floor for delivering air under pressure laterally across the approximate upper margin of the pad and for its eventual distribution downwardly into the air chambers formed between the located divisional channel means, said air supplying means comprising an air nozzle arranged approximately through the upper central portion of the structured floor and designed for delivering air under pressure at this location between the aeration pad and its said proximate structured floor.

4,355,929

FLOW CONTROL DEVICE

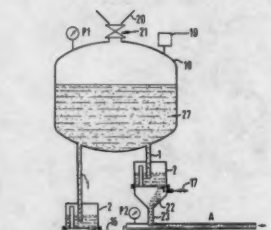
Brian Snowdon, 14, Airedale Ave., Tickhill, Doncaster, South Yorkshire, England

Filed Mar. 10, 1980, Ser. No. 129,136

Claims priority, application United Kingdom, Feb. 9, 1980, 8004413

Int. Cl.³ B65G *53/40*

U.S. Cl. 406—125 **11 Claims**



2. Apparatus for conveying bulk material at a controlled rate comprising means for feeding bulk material to a pressure vessel, means for applying pressure within the pressure vessel, a container located downwardly of the pressure vessel and having a transverse partition including at least one orifice, a conduit extending downwardly from said pressure vessel into the container and terminating above the transverse partition, material receiving means located below the container, and pressure balance means for balancing the pressure at a position below the partition with a position selected to be above material located on the partition when the apparatus is in use.

4,355,930

CONTROL AND LOCKING OF PIVOTING NEEDLE FOR PNEUMATIC PIPE CARRIERS

Claude Carlier, 134, rue Saint Denis, 93100 Montreuil, France

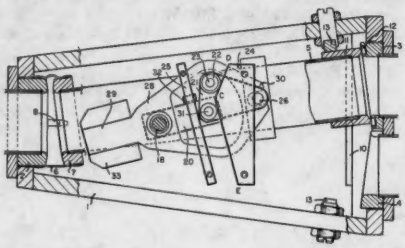
PCT No. PCT/FR79/00100, § 371 Date Jul. 2, 1980, § 102(e) Date Jul. 2, 1980, PCT Pub. No. WO80/00954, PCT Pub. Date May 15, 1980

PCT Filed Nov. 7, 1979, Ser. No. 206,539

Claims priority, application France, Nov. 8, 1978, 78 31521

Int. Cl.³ B65G *51/24*

U.S. Cl. 406—182 **13 Claims**



1. Switch for pneumatic tube conveyor comprising, within a sealed housing, a pivoting switch joining one section of main line at the side of its axis of pivot to a second section of main line or to a section of shunt line at the opposite side, said switch being sealed against a second section of main line by a slight axial displacement of the switch in the direction of compression of an annular gasket disposed at an end of said second section, and the transmission of motion between a drive mechanism and a fulcrum integral with the pivoting switch being carried out by a pivoting control arm acting upon a substantially triangular return arm, one angle of which catches said fulcrum, the return arm (**21**) pivots about an axis (**31**) carried on the end of the control arm (**20**), on which it turns along another of its angles and thus follows totally the pivoting motion of said control arm, and that it carries, in the area of its third angle, a guide wheel (**22**), applied against at least one stationary cam (**24**) serving to orient said return arm during the pivoting of the control arm.

4,355,931

TAPPING DRILL

Roland Leuenberger, 15, Chemin de Bois de la Chappelle, 1213 Onex, Switzerland

Filed Sep. 17, 1980, Ser. No. 188,017

Claims priority, application France, Sep. 24, 1979, 79 24137

Int. Cl.³ B23B *45/12*; A61B *17/16*

U.S. Cl. 408—123 **13 Claims**

1. A tapping drill comprising:

(a) a drive shaft;

(b) means for imparting oscillating movement to said shaft around its longitudinal axis;

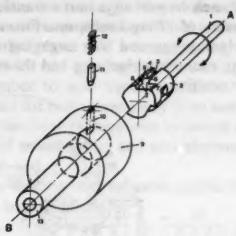
(c) a tool carrier; and

(d) a ratchet mechanism connecting said tool carrier to said shaft, wherein said ratchet mechanism comprises:

(1) an interior drive member provided with a series of axially spaced successive lugs;

(2) an exterior drive member attached to said interior member, and

(3) means for selectively coupling said interior member



with said exterior member through at least one of said lugs in order to transform the oscillating movement to a rotary movement by successive impulses in one direction or another at will.

4,355,932

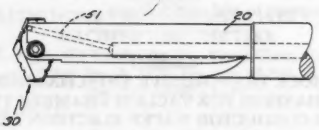
INDEXABLE SPADE DRILL BLADE

Eldo K. Koppelmann, Cumberland, and Wayne E. Blackmun, Barrington, both of R.I., assignors to Santrade Ltd., Lucerne, Switzerland

Filed Jan. 9, 1980, Ser. No. 110,765

Int. Cl.³ B23B *27/16, 51/06;* E21B *10/52*

U.S. Cl. 408—188 1 Claim



1. An indexable spade drill having a boring bar with a clamping slot defining opposite surfaces, a pin rising from one surface into the slot, a blade having a substantially rhomboidal block formation with parallel top and bottom faces, said block having a first pair of adjacent sides defining a first cutting end the junction of which has a first pointed end, said block having a pair of opposite sides defining a second cutting end, the junction of which has a second pointed end, said blade having diametral cutting edges that join the first and second pairs of adjacent sides, the blade clamped in said clamping slot that supports the blade axially and laterally, one of the faces of the blade having a groove extending in the direction parallel to at least one side, a central bore extending between the two faces of said blade, said groove being located to intersect the bore, a clamping bolt extending across the slot to clamp the blade, said pin engaging a portion of said groove whereby when the blade is rotated a half a revolution in its plane to present an opposite pointed end the pin will engage another portion of said groove.

4,355,933

MOUNTING ELEMENT FOR SECURING AN OBJECT TO A SUPPORT STRUCTURE

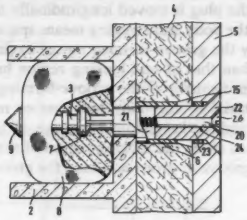
Artur Fischer, Weinhalde 34, 7244 Tumlingen, Waldachtal, Fed. Rep. of Germany

Filed Apr. 30, 1980, Ser. No. 145,058

Int. Cl.³ F16B *13/06;* F04G *21/00*

U.S. Cl. 411—19 13 Claims

1. A mounting arrangement for mounting an object at a distance from a support structure having an anchoring recess, the arrangement comprising a mounting element including an anchoring part having an inserting end provided with a locking portion insertable in said recess and a rear end, a sleeve-shaped intermediate part and a sleeve-shaped trailing part engageable with an object to be fastened, said intermediate part being provided with an internal portion having a bore and being formed with a gap forming a passage for a cementing material to be injected into said recess for locking said locking



portion, said bore having a seal; a fastening screw adapted to puncture said seal and to be received in said bore thereby; and a sleeve engageable with said object and insertable in said trailing part, said sleeve receiving said fastening screw and having an abutment for supporting the object to be fastened.

4,355,934

SELF-PLUGGING BLIND RIVET

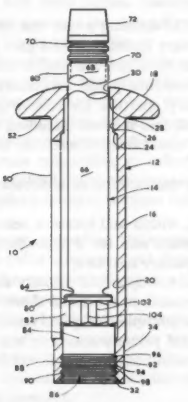
Keith Denham, Welwyn; Leslie R. Prickett, and Lawrence R. Pallister, both of Stevenage, all of England, assignors to Aerpat A.G., Zug, Switzerland

Filed Sep. 26, 1980, Ser. No. 190,969

Claims priority, application United Kingdom, Sep. 28, 1979, 7933837

Int. Cl.³ F16B *13/06*

U.S. Cl. 411—38 14 Claims



1. A self-plugging blind rivet comprising:

a tubular rivet body having a head at one end, an elongate shank which can be expanded radially to form a blind head, and a bore throughout the head and shank;

and a mandrel disposed in the bore of the body, the mandrel having an elongate stem which projects from the head end of the bore of the body, a plug, and a breakneck joining the stem and plug;

the plug having an end portion remote from the stem which is adapted to engage a tail-end portion of the shank remote from the head of the body in a manner such as to cause radial expansion of the shank to form a blind head when the mandrel is pulled to move the plug relatively towards the head end of the body, wherein the diameter of the bore

of the body is reduced progressively towards the head to provide a locking region in the vicinity of the head, and the plug has axially-extending groove-forming means adjacent the breakneck having a maximum diameter greater than that of the locking region for forming one or more longitudinal grooves in the locking region of the body when the plug is moved longitudinally towards the head end of the body and swaging means spaced from the breakneck by the groove-forming means having a diameter greater than that of said locking region but less than the maximum diameter of the groove-forming means for swaging material of the body into one or more of the grooves formed by longitudinal passage of the groove-forming means along the locking region of the bore so as to close the groove or grooves behind the groove-forming means.*

4,355,935

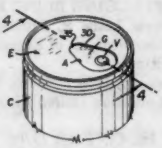
METHOD OF FORMING A CAN END HAVING A VENTED GATE WITHIN A PUSH-DOWN APERTURE

Gerald B. Klein, 13451 Stuart Ct., Broomfield, Colo. 80020

Division of Ser. No. 63,792, Aug. 6, 1979, Pat. No. 4,244,489. This application Jul. 8, 1980, Ser. No. 166,966

Int. Cl.³ B21D *51/44*

U.S. Cl. 413—17 **4 Claims**



1. The method of forming a can end having a push-down multiple-fold primary aperture with a gate panel therebeneath for opening a can to which the end is affixed and having a push-down multiple-fold gated secondary venting aperture within said primary aperture for relieving pressure in a can before it is opened, said method including the steps of:

(a) providing a metal sheet wherefrom metal end blanks are cut;

(b) establishing the location of a circular end on the metal sheet;

(c) establishing, within said location, selected positions for a primary aperture and for a secondary venting aperture within the primary aperture;

(d) forming said multiple-fold primary aperture with a gate panel therebeneath in the metal sheet;

(e) forming said multiple-fold gated secondary venting aperture within said primary aperture; and

(f) thereafter cutting out the blank and finishing the end.

4,355,936

EGG TRANSFER APPARATUS

Leslie P. Thomas, Canton, and George N. Bliss, Franklin, both of Mich., assignors to Diamond International Corporation, New York, N.Y.

Filed Aug. 28, 1980, Ser. No. 182,134

Int. Cl.³ B65G *59/04*

U.S. Cl. 414—118 **16 Claims**

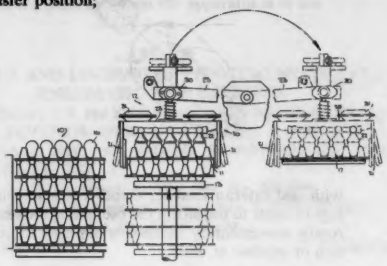
1. An apparatus for transferring egg trays from multiple stacks of trays disposed at a pick-up station to another station which comprises

(a) a horizontal carrier means adapted to be moved from the pick-up station to another station including a plurality of apertures therein;

(b) a rotatably driven member having one end thereof pivotally connected to said horizontal carrier means at the approximate center thereof;

(c) a platform for supporting each of said multiple stack of egg trays and adapted for upwardly indexing the movement of each tray of eggs into a transfer position;

(d) a plurality of lifting heads, one for each stack of trays, and including egg and tray engaging means thereof for engaging each individual egg and the tray of eggs in said transfer position;



(e) a coupling member extending upwardly from each of said lifting heads and disposed in one of said carrier means apertures, said coupling member having the upper portion thereof extending through said carrier means aperture and being of a length sufficient to facilitate vertical movement of said lifting head with respect to said carrier means; and

(f) a stop member mounted to said upper portion of each coupling member adapted to engage said carrier means so as to limit the downward movement of said lifting head with respect to said carrier means.

4,355,937

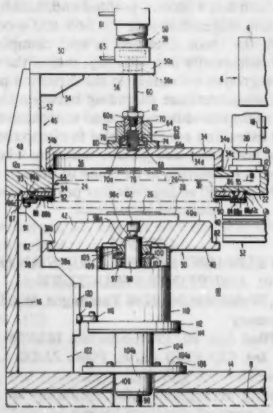
LOW SHOCK TRANSMISSIVE ANTECHAMBER SEAL MECHANISMS FOR VACUUM CHAMBER TYPE SEMI-CONDUCTOR WAFER ELECTRON BEAM WRITING APPARATUS

Alfred Mack, Poughkeepsie; Brian C. O'Neill, Millbrook, and Fred L. Penzetta, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 24, 1980, Ser. No. 219,657

Int. Cl.³ C23C *13/08*

U.S. Cl. 414—217 **9 Claims**



1. In an electron beam writing system for beam writing on work pieces, said system including:

an electron beam vacuum chamber having internally a beam writing area,

an access opening within said vacuum chamber to one side of the beam writing area,

movable means mounted to said vacuum chamber for movement between a first position in sealing contact with said vacuum chamber about said access opening to define an antechamber with said opening and for closing and sealing said antechamber to said vacuum chamber and to the atmosphere and for movement away from said chamber to a second position remote therefrom to permit access to the interior of said antechamber and said electron beam vacuum chamber, and

drive means for shifting said movable means between said first and said second positions,

the improvement comprising

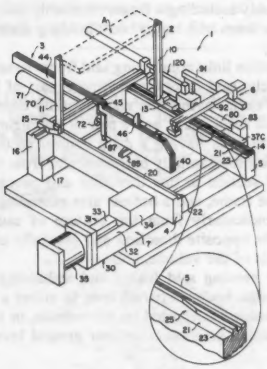
mechanical override means interposed between said drive means and said movable means for dampening impact during sealing contact between said movable means and said vacuum chamber and means for preventing vibration transfer, at the termination of movement of said movable means at said first and said second positions, to said vacuum chamber beam writing area to facilitate simultaneous beam writing on work at said beam writing area and loading and unloading of another workpiece through said access opening.

4,355,938

AUTOMATIC WORK PIECE CHANGER FOR A MILLING MACHINE AND THE LIKE

Jeffrey L. Page, 658 Cambridge Dr., Santa Clara, Calif. 95051

Filed Jun. 4, 1979, Ser. No. 45,339
Int. Cl.³ B65G *63/00*
U.S. Cl. 414—222 **32 Claims**



1. An automatic work piece changer having repetitive cycles of operation for use with a milling machine, drill press and the like comprising:

a work piece hopper for storing a plurality of work pieces to be machined;

means for moving each of said work pieces in succession from said hopper to a work station for machining;

means for clamping each of said work pieces on their side at said work station so as to prevent horizontal and vertical movement during said machining thereof and to permit working all of the top surfce of the work piece; and

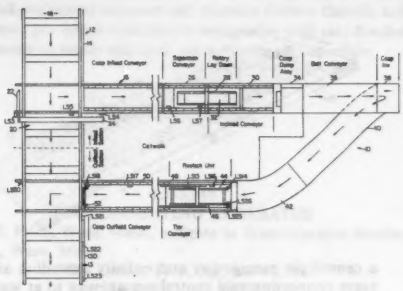
means for ejecting machined work pieces from said changer.

4,355,939

PALLETIZED POULTRY COOP HANDLING SYSTEM

Harry J. Musgrave, P.O. Box 214, Nashville, Ark. 71852

Filed Dec. 27, 1979, Ser. No. 107,626
Int. Cl.³ B65B *21/02*
U.S. Cl. 414—413 **1 Claim**



1. Apparatus for automatically handling poultry coops containing live birds and arranged in tiers on a pallet to unload the birds from the coops, and to load tiers of empty coops onto an empty pallet, which comprises:

means for unstacking a tier of poultry coops;

means for dumping the birds from each unstacked coop to empty each of said coops;

a coop infeed conveyor for advancing a tier of poultry coops toward said unstacking means;

a coop outfeed conveyor adjacent said coop infeed conveyor and laterally spaced-apart therefrom, for advancing a tier of empty poultry coops along a defined path;

a pallet conveyor extending transverse to said coop infeed conveyor and said coop outfeed conveyor, for receiving thereon a pallet carrying a tier of poultry coops containing live birds and moving the pallet to a position that places the tier of coops thereon in alignment with said coop infeed conveyor, and for advancing the pallet after the tier of coops is removed therefrom to a position in alignment with the end of said coop outfeed conveyor so as to be positioned to receive thereon a tier of empty coops;

said pallet conveyor comprising an infeed pallet conveyor section and an outfeed pallet conveyor section, said infeed and outfeed pallet conveyor sections being independently operable; and

a transfer conveyor extending transverse to the outfeed section of said pallet conveyor and disposed adjacent the end thereof, for receiving thereon a pallet transferred from said pallet conveyor;

said outfeed section of said pallet conveyor comprising:

first and second parallel, spaced-apart side frame members disposed transverse to said coop outfeed conveyor,

a tiltable frame mounted for lateral tilting with respect to said side frame member,

a plurality of rollers extending transversely to said side frame members and mounted to said tiltable frame, and means for tilting said tiltable frame to laterally transfer a pallet onto said transfer conveyor.

4,355,940

AUTOMATIC LOADING PLATFORM AND METHOD OF USING SAME

Edward E. Derickson, Mtd Rte., Alberta Dr., Aurora, Ind. 47025

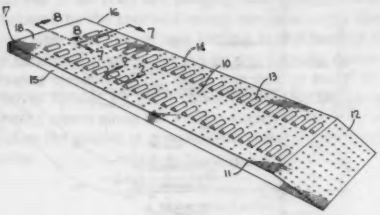
Filed May 21, 1980, Ser. No. 151,872
Int. Cl.³ B65G *67/04*
U.S. Cl. 414—439 **19 Claims**

1. An automatic loading platform adapted for translational

movement and for loading and unloading a vehicle, said platform comprising:

(a) a frame having an upper surface;

(b) first means on said frame movable in response to translational movement of said platform, said first means comprising at least one carrier roller and at least one rotatable wheel, each carrier roller comprising a drive shaft having



a central air passageway and radially extending air passages connecting said central passageway to at least one air chamber defined by an expansible diaphragm and the periphery of said drive shaft; and

(c) second means movable in response to movement of said first means, said second means adapted to support a load such that relative movement between said platform and said load occurs upon movement of said platform.

4,355,941

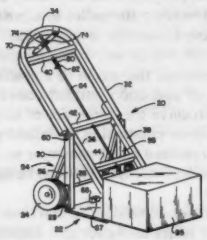
HAND TRUCK CONSTRUCTION

Clarence M. Lehman, 386 Schrock Rd., Worthington, Ohio 43085

Filed Jun. 2, 1980, Ser. No. 155,790

Int. Cl.³ B62B *1/02*

U.S. Cl. 414—490 **1 Claim**



1. A portable load carrying hand truck comprising, in combination, a generally vertically disposed first frame portion pivotally connected at a position intermediate in ends to a second frame portion having an upper and lower end, said second frame portion normally disposed in parallel aligned relationship relative to said first frame portion, said first frame portion including an upper end forming an integral upper handle portion and a lower load engaging portion; said second frame portion having its upper end attached at said pivot connection and extending downwardly from said pivot connection with said first frame portion and including an axle means provided with wheel means and a platform fixed to and extending outwardly at approximately a right angle from the lowe end of said second frame portion; and means for releasably locking said first and second frame member in fixed paralle alignment with one another whereby said upper handle portion of said first frame portion is operable to manipulate said wheel means and platform into a load carrying position; and to independently pivot said lower load engaging portion of said first frame portion relative to said second frame portion upon release of said locking means; said locking means including an elongate rod member connected to said first frame portion for vertical slideable movement and disposed substantially along the vertical centerline of said first frame portion and includes a lower end portion extending downwardly towards said platform, a seat portion mounted on said platform adapted to receive said lower end portion to form a locked position; spring means mounted on said bar member to bias said bar member toward said seat and an actuating lever pivotally mounted at one end to said upper handle portion and to said rod member intermediate to the ends of said lever, the free end of said lever disposed closely adjacent to said upper handle portion for manipulation simultaneously with manipulation of said handle portion.

4,355,942

LOADING AND UNLOADING APPARATUS FOR VEHICLES

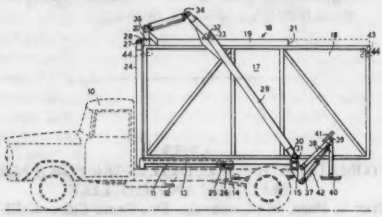
Keith O. Rolfe, 564 Zillmere Rd., Zillmere, Queensland, Australia (4034)

Filed Jul. 15, 1980, Ser. No. 169,028

Claims priority, application Australia, Jul. 23, 1979, PD9673; Jun. 3, 1980, PE3870

Int. Cl.³ B60P *1/00*

U.S. Cl. 414—555 **8 Claims**



1. Loading and unloading apparatus for a vehicle having a chassis, comprising:

(a) a lift assembly including a frame releasably connected to a load in the form of a cargo body holding material to be transported;

(b) parallel motion links connecting said frame to said chassis of the vehicle, said links comprising a pair of L-shaped lifting links each having one end pivotally connected to the chassis of the vehicle, and a pair of stabilizing links of cranked form each having a main central section, a top arm extending substantially perpendicular from the top of said central section in one direction and pivotally connected to the frame, and a bottom arm extending substantially perpendicularly from the bottom of said central section in the opposite direction and pivotally connected to the chassis of the vehicle, and

(c) means for moving said lifting and stabilizing links to move the cargo body, in parallelism, to either a carrying or loaded position supported on the vehicle, or to a loading or unloading position at or near ground level behind the vehicle.

4,355,943

VEHICLE GATE LIFT WITH PROTECTION AGAINST OPERATION WITH IMPROPER LOADS

Morris D. Robinson, 179 Via Los Miradores, Redondo Beach, Calif. 90277

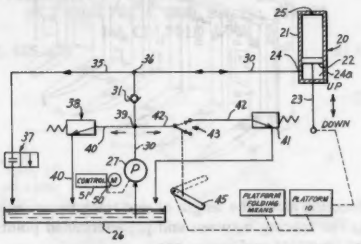
Filed Sep. 17, 1980, Ser. No. 188,241

Int. Cl.³ B60P *1/48*

U.S. Cl. 414—557 **8 Claims**

1. In combination with a vehicle tailgate lift of the type which includes a platform that is adapted to be raised and lowered in a lifting mode while substantially level, and which, at its upper limit is adapted to be tilted to open and close in a

folding mode, both by actuation of a hydraulic actuator comprising a piston-cylinder combination having a power chamber at one side of said piston and a supply port providing access to said power chamber, a sump, and a source of hydraulic fluid under pressure, the improvement comprising: a supply and control circuit for said hydraulic actuator comprising a supply conduit connecting said source to said supply port; a return conduit connecting said supply port to said sump; a first open-closed selector valve in said return concuit adapted selectively to enable and to prevent flow of hydraulic fluid from said supply port to said sump; a first relief valve having a relief pressure setting to relieve pressure in said supply conduit at its relief pressure, and discharging when exposed to fluid at or



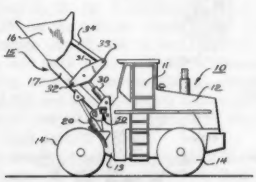
above said relief pressure, discharging said fluid to said sump; a second open-closed selector valve connected between said supply conduit and said first relief valve; said second selector valve being adapted selectively to enable and to prevent flow from said supply conduit to said first relief valve; and a selector for setting platform folding means, which platform folding means prevents or causes a platform folding mechanism to fold said platform upon actuation of said actuator while said platform is near or at its uppermost position, said selector being connected to said second selector valve whereby to enable passage of fluid from said supply conduit to said first relief valve when said platform is to be folded, whereby the folding of the platform with a weight in excess of the weight of the platform itself is prevented by said first relief valve.

4,355,944

LOADER BOOM POSITION RETAINER

Donald D. Lorenc, Mundelein, Ill., assignor to Fiat-Allis Construction Machinery, Inc., Deerfield, Ill.

Filed Dec. 27, 1977, Ser. No. 864,697
Int. Cl.³ E02F 9/24
U.S. Cl. 414—685 **9 Claims**



1. In a lifting apparatus having a lifting boom pivotally supported relative to a support frame and operable into a raised overhead position, a safety device for maintaining the lifting boom in the raised position comprising

load bearing support means operatively connected to a support frame and positioned adjacent a movable lifting boom pivotally supported from the support frame for retaining the lifting boom in a raised position,

said load bearing support means having an aperture formed therein located at a position beneath the movable lifting boom when the lifting boom is pivoted into the raised position, and

lock pin means insertable through said aperture formed in said load bearing support means to prevent the lifting boom from pivotally moving downward from a raised position,

bracket means carried by said load bearing support means and positioned adjacent said aperture formed therein, and

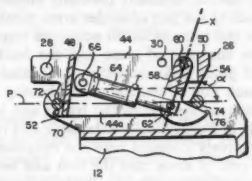
retainer pin means operatively engageable with said bracket means to retain said lock pin means in said aperture.

4,355,945

TOOL MOUNTING APPARATUS

John S. Pilch, Ware, Mass., assignor to Ware Machine Service, Inc., Ware, Mass.

Filed Dec. 3, 1979, Ser. No. 99,518
Int. Cl.³ B66F 9/00; E02F 3/74
U.S. Cl. 414—686 **6 Claims**



1. A tool mounting apparatus for detachably mounting a tool component to a carrier, said apparatus comprising:

(a) a power hitch component mounted to said carrier, said power hitch component having a first contact surface with a leading end, an intermediate portion, and a trailing end;

(b) first and second engagement members on said tool component;

(c) notch means on said power hitch component, said first engagement member and said notch means configured to lockingly engage one another;

(d) lock means mounted to said power hitch component for movement relative thereto, said lock means having a second contact surface with a leading end, an intermediate portion and a trailing end, said lock means being movable between an unlocked position and a locked position; and

(e) means for moving said lock means between said unlocked and locked positions;

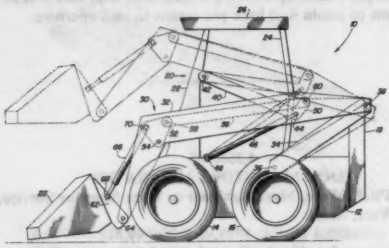
(f) movement of said lock means from its unlocked position to its locked position causing relative movement between said second engagement member and said power hitch component from said intermediate portion toward said trailing end of said first contact surface and relative movement between said second engagement member and said lock means from said intermediate portion toward said trailing end of said second contact surface, said intermediate portion initially first contacting said second engagement member as said lock means moves from said unlocked position to said locked position;

(g) movement of said lock means from its unlocked position to its locked position also causing relative movement between said power hitch component and said tool component for lockingly engaging said notch means and said first engagement member and clamping said tool component to said power hitch component.

4,355,946
LIFT ARM AND CONTROL LINKAGE STRUCTURE FOR LOADER BUCKETS

Lloyd A. Wykhuis, and Michael J. O'Neill, both of Mayville, Wis., assignors to Deere & Company, Moline, Ill.

Filed Sep. 29, 1980, Ser. No. 191,392
Int. Cl.³ B66F 9/00
U.S. Cl. 414—707 2 Claims



1. In a loader vehicle including a longitudinal main frame, a pair of loader arms respectively located at opposite sides of the frame, a loader bucket vertically pivotally mounted to respective forward ends of the pair of loader arms; a pair of hydraulically extensible and retractable tilt actuators respectively connected between the pair of arms and the bucket, first and second pairs of guide links respectively located with one of each pair on each side of the frame and having opposite end portions pivotally connected to the frame and to the pair of arms, and a pair of hydraulically extensible and retractable lift actuators respectively coupled between opposite sides of the frame and the pair of arms, and the first and second pairs of guide links being so dimensioned and located relative to each other and the pair of loader arms that as the latter are lifted, through operation of the lift actuators, they follow respective paths which maintain the bucket at least as far forward in any raised position as it is in a fully lowered position, the improvement comprising: said first pair of guide links each being defined by two leg portions joined to be generally L-shaped and with the respective ends of one of the two leg portions of the pair of guide links being pivotally connected to the frame; and a self-levelling linkage means, formed in part by the pair of tilt actuators, connected between the bucket and another of the two leg portions of the first pair of guide links for maintaining the bucket in substantially the same attitude throughout the movement of the lift arms.

4,355,947
HOOK-TYPE CARRIAGE PLATE WITH FLOATING FORKS

Wayne T. Wiblin, Ashtabula, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Continuation-in-part of Ser. No. 648,442, Jan. 12, 1976, abandoned. This application Mar. 31, 1978, Ser. No. 892,055
Int. Cl.³ B66C 3/00
U.S. Cl. 414—785 1 Claim

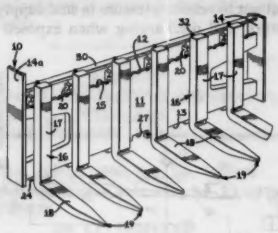
1. A carriage assembly for use on a lift truck, comprising:

a hook-type carriage plate having upper and lower edges, a front, an upwardly facing horizontal track extending along the upper portion of said plate to form a horizontal guide member integral with said carriage plate, and a plurality of index notches along the upper edge of said plate,

a plurality of fork assemblies each having a vertical leg, a forwardly extending lower horizontal leg, and a rearwardly and downwardly extending upper hook secured to the upper end of said vertical leg, each fork assembly being mounted on said carriage plate for lateral sliding movement along said carriage plate, with said vertical leg being adjacent the front of said carriage plate and with said hook extending rearwardly across said upper edge of said carriage plate and down into sliding engagement with said track,

an elongated spacer bar separate from said carriage plate and removably positioned adjacent said fork assemblies in parallelism with said track,

securing means for securing said spacer bar solely to said fork assemblies and for securing said fork assemblies to said spacer bar at predetermined points along the length of said spacer bar to position said fork assemblies along said track with the spacing between said fork assemblies in a direction along the length of said track being determined by the spacing between said predetermined points along the length of said spacer bar,

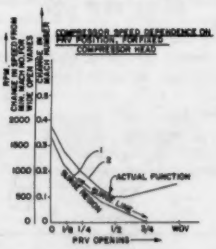


limit means for permitting said spacer bar to move lengthwise relative to said carriage plate and for preventing said spacer bar from moving lengthwise relative to said carriage plate more than a predetermined distance, said limit means comprising a stub secured to said spacer bar and extending into one of said index notches of said carriage plate, said stub being undersized relative to said notch.

4,355,948
ADJUSTABLE SURGE AND CAPACITY CONTROL SYSTEM

Kenneth J. Kountz, Hoffman Estates, Ill., and Dean K. Norbeck, York, Pa., assignors to Borg-Warner Corporation, Chicago, Ill.

Division of Ser. No. 75,042, Sep. 12, 1979, Pat. No. 4,275,987. This application Feb. 17, 1981, Ser. No. 235,266
Int. Cl.³ F01D 17/02
U.S. Cl. 415—1 2 Claims



1. A method of controlling surge and capacity of an inverter driven centrifugal compressor refrigeration system comprising the steps of:

deriving a signal indicating position of the adjustable inlet vanes of a centrifugal compressor of a refrigeration system,

formulating a first output from said signal as a function of vane position,

formulating a second output from said signal as a function of

speed deviation of the compressor from minimum Mach number based on said vane position, and

adjusting said first and second outputs to control the operation of a centrifugal compressor having unknown surging characteristics and avoid surge at all expected operating points.

4,355,949

CONTROL SYSTEM AND NOZZLE FOR IMPULSE TURBINES

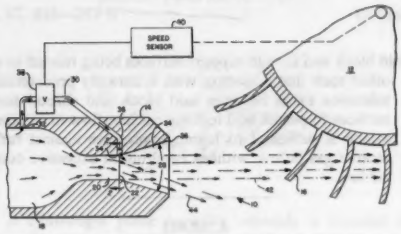
John M. Bailey, Dunlap, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US80/00116, § 371 Date Feb. 4, 1980, § 102(e) Date Feb. 4, 1980

PCT Filed Feb. 4, 1980, Ser. No. 149,352

Int. Cl.³ F01D *17/06*

U.S. Cl. 415—35 **11 Claims**



1. A fluid impulse turbine system (10) comprising:

(a) a rotatably mounted turbine wheel means (12) rotated in response to a driving force from a jet driving fluid,

(b) speed sensing means (40) connected to sense the speed of said turbine wheel means (12),

(c) nozzle means (14) spaced from said turbine wheel means (12) and operative to selectively direct a jet of driving fluid from a nozzle opening (26) against said turbine wheel means (12), said nozzle means (14) including:

(1) a neck section (20,46)

(2) a diverging section (24) extending between said neck section (20,46) and said nozzle opening (26), said diverging section (24) tapering outwardly to said nozzle opening (26) from a juncture (22,48) with said neck section (20,46), and

(d) fluid diverter means (30, 38, 74) mounted upon said nozzle means (14) and selectively operable to divert a flow of fluid from said neck section (20,46) outwardly at an angle to the common central axis of said neck section (20,46) and diverging section (24) to reduce the driving force applied by the jet of driving fluid from said nozzle opening (26) on the turbine wheel means (12), said fluid diverter means (30, 38, 74) acting to divert the flow of fluid from said neck section (20,46) at a location substantially aligned with the juncture (22,48) between said neck section (20,46) and said diverging section (24) by providing a flow of control fluid transverse to the flow of fluid from said neck section (20,46),

(e) said speed sensing means (40) operating to cause said fluid diverter means (30, 38, 74) to divert the flow of fluid from said neck section (20, 46) outwardly when the speed of said turbine wheel means (12) exceeds a desired speed.

4,355,950

SELF-PRIMING CENTRIFUGAL PUMP

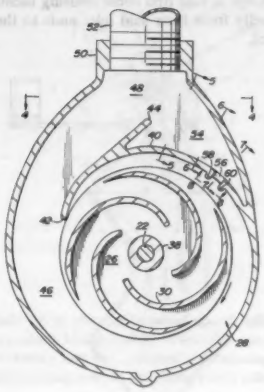
Henry M. Pollak, 823 Brookside Rd., Pottstown, Pa. 19464

Filed May 27, 1980, Ser. No. 153,500

Int. Cl.³ F04D *9/02*

U.S. Cl. 415—53 R **7 Claims**

1. A self-priming centrifugal pump comprising a casing having a pumping chamber, said casing having an inlet and an outlet communicating with said pumping chamber, said outlet being above the pumping chamber, a motor driven impeller in said pumping chamber for pumping a liquid from said inlet to said outlet, said casing having a priming chamber, said priming chamber being above the pumping chamber and communicating at one end with said outlet, a wall of said housing which separates said pumping chamber and priming chamber having a flow passage for recirculating a priming liquid from said



priming chamber to the upper end portion of said pumping chamber at a location radially outwardly from said impeller, means for creating a discontinuity of flow in the pumping chamber at said passage so that priming liquid can be recirculated under the combined forces of gravity and suction acting to self-prime the pump, and said passage being sufficiently large so that it deaerates the priming liquid while supplying sufficient priming liquid to prevent a short circuit of gas from the outlet to the inlet during the priming of the pump.

4,355,951

FULL ADMISSION PITOT PUMP

Ronald D. Grose, Omaha, Nebr., assignor to InterNorth, Inc., Omaha, Nebr.

Continuation-in-part of Ser. No. 146,136, May 2, 1980, Pat. No. 4,304,104. This application Oct. 16, 1981, Ser. No. 311,975

Int. Cl.³ F04D *1/14*

U.S. Cl. 415—89 **9 Claims**

1. A full admission pitot pump comprising,

a rotatable outer housing means comprised of at least a first rotor housing member and at least a first stator housing member secured to said rotor housing member, said rotor housing member and said stator housing member having first and second ends,

said rotor housing member having a reduced diameter portion at its said first end and an enlarged diameter portion at its said second end,

said stator housing member having an enlarged diameter portion at its said first end and a reduced diameter portion at its said second end,

the second end of said first rotor housing member being secured to the first end of said first stator housing member,

a stator means positioned within said outer housing means,

means for rotating said outer housing means relative to said stator means,

said stator means comprising a first stator portion positioned in said first rotor housing member and a second stator portion positioned within said first stator housing member,

said first rotor housing member including a first rotor portion which rotatably embraces said first stator portion,

said first rotor housing member and said first rotor portion

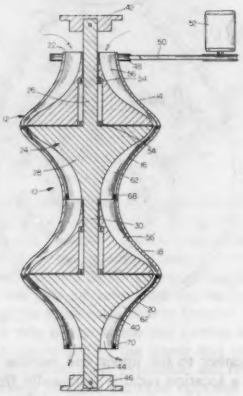
defining a plurality of spaced-apart passageways therebetween,

said second stator portion having a plurality of spaced-apart passageways formed therein,

said passageways in said rotor housing member and said second stator portion having inlet and discharge ends,

the discharge ends of said passageways in said first rotor housing member communicating with the inlet ends of said passageways in said second stator portion,

said passageways in said first rotor housing member extending outwardly from their said inlet ends to their said discharge ends,



said passageways in said second stator portion extending inwardly from their said inlet ends to their said discharge ends,

means for supplying fluid to the inlet ends of said passageways in said first rotor housing member,

the rotation of said outer housing means causing the fluid supplied to said inlet ends of said passageways in said first rotor housing member to be progressively increasingly compressed as it passes from the inlet ends of the passageways in said first rotor housing member to the discharge ends of the passageways in said second stator portion.

4,355,952

COMBUSTION TURBINE VANE ASSEMBLY

David L. Brown, Swarthmore, and Victor D. Miller, Jr., Parkside, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 29, 1979, Ser. No. 53,630
Int. Cl.³ F01D *5/18*
U.S. Cl. 415—115 **5 Claims**

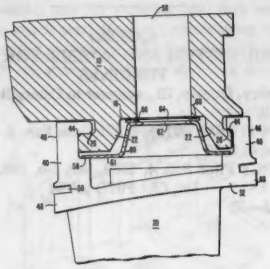
1. A cooled vane and vane support assembly for a combustion turbine engine comprising:

an individual vane mounting block having inwardly projecting opposed spaced support means for generally axial sliding receipt of the vane and having an inwardly facing sealing surface defining an outlet from a cooling air aperture therethrough disposed between said spaced support means;

a vane having an outer shroud defining generally radially outwardly projecting opposed spaced support means each having an inwardly facing support surface in complementary engagement with an outwardly facing support surface of said support means on said mounting block;

a cooling air receiving chamber disposed between said opposed spaced vane support means and forming a part of said outer shroud and having an outwardly facing sealing surface defining entry to an opening therein generally coterminous with the aperture through said mounting block to provide for coolant air flow into said vane shroud;

means for directing leakage coolant air flow from said block aperture between said block and shroud sealing surfaces to said block and shroud support surfaces; and



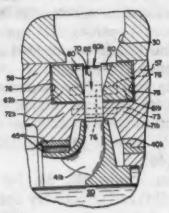
said block and shroud support surfaces being related to each other such that a spacing with accurately predetermined tolerance exists between said block and shroud sealing surfaces to permit said leakage coolant flow in an amount which is sufficient to maintain pressure against turbine motive gas inflow without resulting in excessive coolant air loss.

4,355,953

FLOW-ADJUSTED HYDRAULIC ROTARY MACHINE

Richard M. Nelson, Portland, Oreg., assignor to Guy F. Atkinson Company, Portland, Oreg.

Filed Apr. 7, 1980, Ser. No. 138,174
Int. Cl.³ F04D *29/56*
U.S. Cl. 415—164 **10 Claims**



1. A hydraulic rotary machine comprising:

a case defining a stage in fluid communication between an inlet and a discharge;

a shaft rotatably disposed in the case and extending through the stage;

a bladed rotor secured to the shaft for rotation within the stage;

a pluraity of guide vanes uniformly spaced circumferentially about the rotor and generally tangentially oriented with respect to the periphery of the rotor;

a pair of stationary vane rings axially positioned on opposite sides of the guide vanes and surrounding the rotor;

pivot means for pivotally securing each guide vane to the stationary vane rings, each such pivot means having a pivot axis aligned parallel to the axis of the shaft;

a pair of rotatable vane rings axially positioned on opposite sides of the guide vanes radially outward from the pivot means, the rotatable vane rings and the stationary vane rings having opposed surfaces which cooperate with opposing surfaces of adjacent guide vanes to define flow passageways,

the opposed surfaces of the rotatable vane rings converging

progressively toward one another and the opposing surfaces of the guide vanes converging progressively toward one another in a direction proceeding inwardly toward the bladed rotor such that the passageways maintain a streamlined shape and become progressively smaller in both radial and axial planes in such direction and in all positions of adjustment of the vanes; and

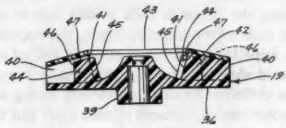
slide means for slidably securing each guide vane to the rotatable vane rings so that a rotation of the rotatable vane rings relative to the stationary vane rings changes the minimum cross-sectional areas of the passageways between guide vanes.

4,355,954

PUMP IMPELLER

James D. Wilson, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa

Filed Jul. 18, 1980, Ser. No. 170,111
Int. Cl.³ F04D *29/66, 1/04*
U.S. Cl. 415—213 B **13 Claims**



1. A centrifugal pump impeller rotatable in forward and reverse directions comprising: a base with a hub at the axis of rotation; a plurality of vanes fixed to said base and extending upwardly thereform, a first group of said vanes being spaced about said rotational axis with leading edges at a first radius spaced from said axis and with bodies extending outwardly toward the outer periphery of said base, a second group of said vanes being disposed between adjacent pairs of at least a portion of said first group of vanes with leading edges at a second radius closer to said rotational axis than the leading edges of said first group of vanes and with bodies extending outwardly and upwardly, said second group of vanes including vanes having at least a portion effectively reduced in axial height; and an impeller cover attached to at least a portion of one of said groups of vanes and axially spaced above the other group for defining a fluid passageway between the axial extremities of said other group of vanes and said impeller cover to reduce turbulent flow through said impeller when rotated in said reverse direction.

4,355,955

WIND TURBINE ROTOR SPEED CONTROL SYSTEM

Adrian V. Kisovec, Munich, Fed. Rep. of Germany, assignor to The Boeing Company, Seattle, Wash.

Filed Apr. 6, 1981, Ser. No. 251,292
Int. Cl.³ F03D *7/04*
U.S. Cl. 416—23 **20 Claims**

1. A wind turbine rotor speed control system, comprising:

a fixed turbine blade adapted to be mounted on a shaft for rotation by the wind;

a pivotal blade tip mounted on each of the respective ends of the fixed blade, said blade tips being mounted on pitch axes substantially at right angles to the rotation axis of the fixed blade;

said fixed blade having trailing edges in opposite directions on opposite sides of the rotation axis;

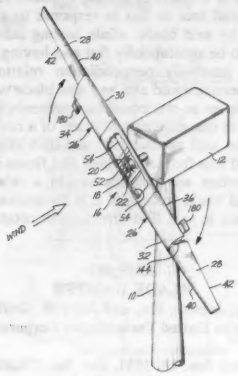
a tab pivotally secured to and to trail from each of said respective trailing edges of said fixed blade;

each tab being adapted to be aligned with the relative wind on the fixed blade;

each tab being connected to a respective blade tip by linkage means;

each linkage means being adapted to pivot the respective blade tip in accordance with the action of the relative wind on the tab;

said pivoting of the blade tip effecting reduction of flapping and unloading of the tip blade, effecting unfeathering of



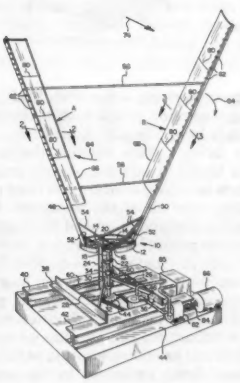
the blade tip at the cut-in wind speed, effecting substantially constant blade R.P.M. from the cut-in to the rated wind velocity and at a gradually increasing shaft torque, and maintaining proper tip blade pitch schedule.

4,355,956

WIND TURBINE

James R. Ringrose, and Leonard G. Dahle, both of Portland, Oreg., assignors to Leland O. Lane, Newport, Oreg., by said James R. Ringrose

Filed Dec. 26, 1979, Ser. No. 106,919
Int. Cl.³ F03D *3/06*
U.S. Cl. 416—132 B **10 Claims**



1. A wind turbine for producing rotary motion in response to air currents, comprising:

a rotating frame having an axis of rotation and a first direction of rotation about said axis, and a base for rotatably supporting said frame, said frame having a plurality of rigid arms fixedly attached thereto, said arms extending angularly outwardly from said axis of rotation, each making an acute angle with said axis of rotation,

and a plurality of blades located radially outwardly from said axis of rotation of said frame, each being attached to a said rigid arm,

each said blade being supported by a said arm for movement

in said first direction of rotation about the axis of said frame, each said blade having a rigid connection with a said arm,

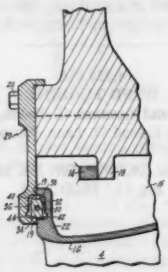
and each said blade having a trailing portion rearward of said rigid connection in respect to said direction of rotation which is formed of tough, flexible, resilient, plastic sheet material free to flex in response to air currents encountered by said blade, while having substantial restoring force to be substantially flat and having a lateral cross section in generally perpendicular relation to a radial direction between said axis and said blade when said blade portion is in an at-rest condition, wherein said blade portion flexes in one direction for part of a revolution of said frame when said air currents are in a relative direction toward said axis from said blade and flexes in the opposite direction when air currents are in a relative direction toward said blade from said axis for providing a component of force in said first direction of rotation.

4,355,957

BLADE DAMPER

Perry P. Sifford, Jupiter, Fla., and Jerry H. Griffin, Pittsburgh, Pa., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jun. 18, 1981, Ser. No. 274,897
Int. Cl.³ F01D *5/16*
U.S. Cl. 416—145 **5 Claims**



1. A rotor comprising a disc with blade connector means; blades being connected to said turbine disc around its periphery; each blade having an airfoil, platform, a root section, and a forwardly facing surface adjacent the platform; means for holding said blades in said disc against axial movement; said holding means including a cover plate fixed to said turbine disc and extending over all of the forwardly facing surfaces of adjacent blades; a plurality of said forwardly facing surfaces having a damper pocket located therein, each pocket having an inner and outer surface, said cover plate having an annular groove located therearound having an inner and outer cylindrical surface; each outer surface of each pocket being at an angle to and crossing the outer cylindrical surface of the annular groove; a stiff damper being positioned in each of a plurality of said pockets and extending into said annular groove; one end of said damper being supported by the outer surface of the annular groove in the cover plate and the other end of the damper being supported by the outer surface of the pocket when the dampers are thrown outwardly by centrifugal force.

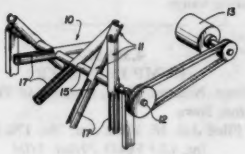
4,355,958

ROTARY IMPELLER FOR FLUID DRIVEN MACHINE

Roy C. Cornick, 2324 Ferry, Box 1447, Anderson, Calif. 96007

Filed Sep. 18, 1981, Ser. No. 303,591
Int. Cl.³ F03D *3/02*
U.S. Cl. 416—197 A **2 Claims**

1. An impeller for a fluid driven machine comprising an impeller shaft adapted for connection with a machine, a plurality of equal length equal diameter cylindrical cross section impeller blades fixed on said shaft substantially in equidistantly spaced relationship axially of the shaft, the impeller blades also being equidistantly spaced circumferentially of the shaft so as to define between adjacent blades equal acute angles around the circumference of the shaft, each impeller blade having a center full cylindrical hub portion provided with a through opening across the axis of the blade and coaxially of said shaft and receiving the shaft therethrough, and the opposite end portions of each impeller blade being cut away longitudinally



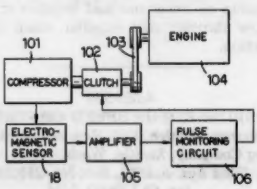
of the blade on diametrically opposite sides of the blade from points defining the opposite ends of said hub to and through the opposite ends of the impeller blade, the opposite end portions of the impeller blade being straight and of equal length radially of said shaft and being cylindrically curved in cross section so as to define a pair of oppositely facing air scoops in relation to rotational movement of said shaft and the cylindrically curved wall of each scoop encompassing an arc greater than a half-cylinder around the longitudinal axis of each blade.

4,355,959

ROTATION SENSOR OF A SWASH-PLATE TYPE COMPRESSOR

Hiroya Kono; Jun Hasegawa, both of Kariya; Mitsukane Inagaki, Anjo, and Hisao Kobayashi, Kariya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Oct. 8, 1980, Ser. No. 195,055
Claims priority, application Japan, Oct. 26, 1979, 54-138864; Aug. 26, 1980, 55-117572
Int. Cl.³ F04B *49/00*
U.S. Cl. 417—223 **14 Claims**



1. A rotation sensor for a swash-plate type compressor which includes a housing with at least one cylinder bore, a rotary shaft rotatably retained by said housing, a swash-plate secured thereto in a slant posture, and at least one piston engaged with said swash-plate for being reciprocated in said cylinder bore according to the rotation of said swash-plate, said rotation sensor comprising:

a part of the peripheral portion of said swash-plate as a portion-to-be-sensed; and

an electromagnetic sensor disposed at a position opposed to a part of a movement locus described by said portion-to-be-sensed according to the rotation of said swash-plate for generating an electric signal respondent to variation of magnetic flux density caused by every passing of said portion-to-be-sensed close thereto, said electromagnetic

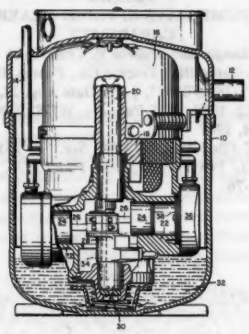
sensor including a permanent magnet and a coil disposed in the vicinity thereof.

4,355,960

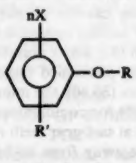
COMPRESSOR REFRIGERATION SYSTEM UTILIZING THERMALLY STABLE REFRIGERATION LUBRICANTS CONTAINING ALKYL POLYHALOPHENYL ETHERS

Gordon C. Gainer, Penn Hills, and Russell M. Luck, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 9, 1980, Ser. No. 157,995
Int. Cl.³ C10M *1/30;* F04D *17/00*
U.S. Cl. 417—419 9 Claims



1. A compressor refrigeration system employing a halocarbon refrigerant, having a lubricant composition in contact with the halocarbon refrigerant, the lubricant composition having lubricity and chemical and thermal stability in the presence of halocarbon refrigerant at temperatures of up to 130° C., the lubricant composition consisting essentially of a thermally stable oil containing a minor amount of a thermolubricity additive having the chemical formula:



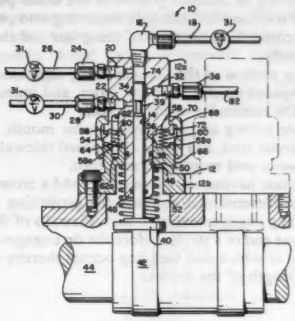
where R=an alkyl group having from 4 to 18 carbon atoms, n=a number from 1 to 4, X=CL, F and their mixtures and R' is a group selected from the group consisting of CL, F, H, alkyl having from 4 to 18 carbon atoms, phenyl, phenoxy, and mixtures thereof, said additive being substantially completely soluble in the oil over the expected temperature range of the refrigeration system, the additive providing for good lubricity and thermal stability in the lubricant composition at cold start-up, and at hot compressor operating temperatures while in vapor contact with hot halocarbon refrigerant, and the lubricant composition being highly resistant to chemical reaction with the halocarbon and/or the materials in the refrigeration system at the expected temperatures and operating conditions of the refrigeration system.

4,355,961

CONTROLLING MEANS FOR A FUEL VALVE

Thomas C. Riggs, Okmulgee, Okla., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Apr. 3, 1978, Ser. No. 892,699
Int. Cl.³ F04B *7/04*
U.S. Cl. 417—494 8 Claims



1. Means for controlling a hydraulically-operated fuel valve, comprising:

a housing;

said housing having a chamber-defining bore formed therein;

means for admitting hydraulic fluid into said bore-defined chamber;

means for expelling hydraulic fluid from said chamber, to operate a hydraulically-operated fuel valve; and

means for receiving hydraulic fluid which has been expelled by said expelling means and conducting the same through said bore, for venting thereof from said housing; wherein

said receiving and conducting means comprises a pair of spaced apart ports, each of said ports opening externally of said housing and internally onto said bore;

said expelling means comprises valving means movable within said bore for opening and closing said ports to and from communication with each other for given periods of time; and

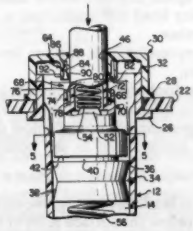
said housing further has means selectively operative for altering movement of said valving means relative to said housing, correspondingly to alter said given periods of time.

4,355,962

PUMP DISPENSER WITH SEALING PLUNGER

Wallace F. Magers, Leawood, Kans., assignor to Realex Corporation, Kansas City, Mo.

Filed Dec. 26, 1979, Ser. No. 106,924
Int. Cl.³ F04B *21/04, 39/10;* G01F *11/02*
U.S. Cl. 417—552 3 Claims



1. In a liquid dispensing pump having a piston that is oper-

ated within the hollow body of the pump by a plunger that reciprocates axially through an opening in a collar at one end of the pump body, the improvement comprising a direct seal between the collar and the plunger when the latter is at one end of a stroke for preventing leakage through said opening, said seal including:

an annular projection as one part of said seal; and

means defining an annular groove as the other part of said seal and disposed for matingly receiving said projection;

said parts comprising portions of the collar and the plunger respectively,

said sealing portion of the plunger being separate from said piston, spaced axially from the latter, and immobile relative to the remainder of the plunger,

said groove having an outermost annular mouth, an innermost annular root, and a pair of opposed sidewalls extending between said mouth and said root,

said projection having an outermost tip and a cross-sectional thickness dimensioned to cause the projection to wedge into sealing engagement with said sidewalls of the groove at said one end of a stroke before the tip engages said root, the point at which said wedging occurs thereby determining the length of the stroke.

4,355,963
HORIZONTAL ROTARY COMPRESSOR WITH OIL FORCED BY GAS DISCHARGE INTO CRANKSHAFT BORE

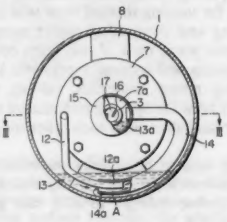
Hideharu Tanaka, Amagasaki; Koji Ishijima, and Toshihide Koda, both of Shizuoka, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 4, 1979, Ser. No. 99,727

Claims priority, application Japan, Dec. 28, 1978, 53-166076; Jan. 5, 1979, 54-512[U]

Int. Cl.³ F04C *18/00, 29/02;* F16N *7/30, 21/00*

U.S. Cl. 418—63 **2 Claims**



1. A horizontal rotary type compressor comprising:

a closed shell;

a rotary compression unit housed within said closed shell, said rotary compression unit having a cylinder, a cylinder head and a frame enclosing both ends of said cylinder, a piston eccentrically rotatable in said cylinder about an axis extending horizontally, a crankshaft fitted in said piston and having a central axial lubrication bore, and a vane dividing the space defined within said cylinder by said piston, cylinder head and frame into a suction and compression chamber;

said rotary compression unit further having a refrigerant discharge port;

a refrigerant gas discharge pipe connected at one end to said refrigerant gas discharge port and having the other end arcuately shaped and positioned below the surface level of lubricant oil accumulated in the bottom of said closed shell;

and

a lubricant oil-gas feed tube having one end arcuately shaped and disposed below the surface level of lubricant oil in the bottom of said closed shell and having the other end opening into said central lubrication bore in said crankshaft, said other end of said refrigerant gas discharge pipe extending into said one end of said lubricant oil-gas feed tube, the portions of said discharge pipe and oil-gas feed tube which are below the surface level of lubricant oil being of substantially uniform diameter, said lubricant oil-gas feed tube portion having a larger diameter than said refrigerant gas discharge pipe portion for leaving a lubricant oil induction gap between the inner periphery of said lubricant oil-gas feed tube and the outer periphery of said other end of said refrigerant gas discharge pipe within the one end of said lubricant oil-gas feed tube, whereby lubricant oil accumulated in the bottom of said closed shell is supplied to said lubrication bore in said crankshaft by the injection of refrigerant gas discharged from said compression chamber into said lubricant oil-gas feed tube through said refrigerant gas discharge pipe.

4,355,964
GEAR PUMP HAVING FLUID DEAERATION CAPABILITY

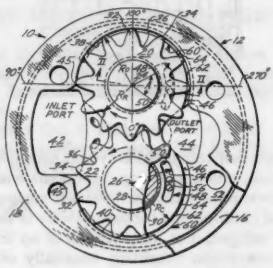
Scott A. Rodibaugh, and Delwin E. Cobb, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US80/01087, § 371 Date Aug. 22, 1980, § 102(e) Date Aug. 22, 1980, PCT Pub. No. WO82/00689, PCT Pub. Date Mar. 4, 1982

PCT Filed Aug. 22, 1980, Ser. No. 251,526

Int. Cl.³ F01C *1/18, 21/00;* F04C *2/18, 15/00*

U.S. Cl. 418—76 **11 Claims**



1. In a gear pump **(10)** having a housing **(12)** defining first and second intersecting cavities **(38,40)** and inlet and outlet ports **(42,44)**, first and second intermeshing gears **(20,22)** having a plurality of teeth **(32)** and a plurality of teeth roots **(36)**, each gear **(20,22)** being positioned respectively in one of the first and second cavities **(38,40)**, the improvement comprising:

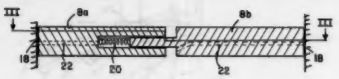
bleed port means **(48)** for communicating entrained air collected in the fluid at said gear teeth roots **(36)** as a result of centrifugal force away from said inlet and outlet ports **(42,44)**, said bleed port means **(48)** including a bleed slot **(50)** defined in said housing **(12)** and communicating directly with said gear teeth roots **(36)** in a preselected angular region of each of said cavities **(38,40)**; and

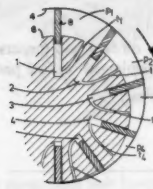
charging passage means **(60)** for communicating fluid under pressure at said outlet port **(44)** with said teeth **(32)** and encouraging the movement of entrained air radially inwardly toward said bleed slots **(50)**, said charging passage means **(60)** including a charging slot **(62)** defined in said housing **(12)** and being located radially outwardly of each of said bleed slots **(50)**, said charging slots **(62)** extending peripherally from said outlet port **(44)** back through the 180° point relative to a zero degree position of intermeshing contact of said gears **(20,22)**.

4,355,965
ROTARY SLIDING VANE DEVICE WITH RADIAL BIAS CONTROL

Frank E. Lowther, Buffalo, N.Y., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Feb. 4, 1980, Ser. No. 118,397
Int. Cl.³ F01C 19/08, 21/04; F04C 18/00, 29/02
U.S. Cl. 418—111 1 Claim





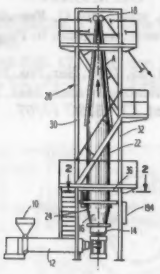
1. A rotary sliding vane fluid device comprising:
a casing having a chamber;
a rotor disposed for rotation within said chamber;
a vane slidably mounted in a slot within said rotor and extending outward toward the interior wall of said chamber and disposed for outward and inward movement relative to said rotor in response to rotation thereof, said vane having a longitudinal passage therethrough, said vane further comprising:
a pair of interlocking elements, each of said pair of interlocking elements is ported to permit fluid flow therethrough to the axial end portions thereof to supply a lubricating film of fluid at said ends of said vane;
means disposed between said interlocking elements to bias said interlocking elements apart and toward the side walls of said chamber; and
a port in said rotor extending from said the lower end of said slot to the surface of said rotor at a point forward of said vane to permit flow of fluid from said chamber to beneath the lower end of said vane whereby the pressure of said fluid within said chamber is applied to said vane to vary the bias of said vane against said chamber as said rotor rotates within said chamber and to supply fluid through said longitudinal passage in said vane to provide a lubricating film of fluid to the tip regions of said vane.

4,355,966
AUTOMATIC CONTROL OF BUBBLE SIZE IN BLOWN FILM

Edward E. Sweeney, Wenonah, and Paul N. Magowan, Moorestown, both of N.J., assignors to E. B. Westlake, Jr., Havertown, Pa., a part interest

Filed May 4, 1981, Ser. No. 260,006
Int. Cl.³ B29D 23/04
U.S. Cl. 425—140 9 Claims

1. In apparatus for making blown film including a cooling tower, nip rolls at the top of the tower engaging the film, a die at the bottom of the tower through which the film is extruded, and means delivering air or gas under pressure to the film to blow it into a bubble; a means to automatically control the size of the bubble above its frost line so that it maintains a predetermined diameter comprising:
(a) guide and centering means mounted on said tower above and adjacent the die to maintain the bubble centered along an axis between the center of the die and the juncture of said nip rolls,
(a') said guide and centering means including rotatable rolls engaging the front, back and sides of the bubble and means to adjustably move said rolls in unison,
(b) light sources mounted to move with said guide and centering means and at predetermined locations relative to the surface of the bubble,
(c) light sensors mounted in alignment with said source to move with said guide and centering means,
(d) normally closed valves operatively connected to said sensors, and

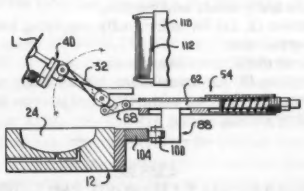


(e) a source of compressed air or gas operatively connected to the valves of two of said sensors
whereby when the diameter of the bubble is undersized the beam of one of said light sources will be spaced outwardly of the bubble and said one sensor aligned therewith will cause its valve to open and deliver air or gas to the undersized bubble until it is restored to its predetermined diameter, and when the diameter of the bubble is oversized the beam of another of said light sources will intersect the bubble and the sensor aligned with said other light source will cause its valve to open and vent air or gas from the oversized bubble until it is restored to its predetermined diameter.

4,355,967
LABEL APPLYING DEVICE

Ernest W. Hellmer, Chicago, Ill., assignor to The Continental Group, Inc., Stamford, Conn.

Filed Sep. 30, 1980, Ser. No. 192,393
Int. Cl.³ B29C 17/07; B65H 3/08, 3/46
U.S. Cl. 425—503 13 Claims



1. A transfer device for transferring a label and like sheet from a stack to a moving member, said transfer device comprising an arm mounted for pivoting about a fixed first pivot axis defined by a first pivot shaft for movement between a position adjacent a stack to a position adjacent a moving member and return, a transfer head having transfer means for picking up and discharging labels and like sheets, a second pivot shaft pivotally mounting said transfer head on said arm for movement with said arm and for pivoting relative to said arm about a second pivot axis movable with said arm wherein said

transfer head moves from a generally vertical position adjacent a stack to a generally horizontal position adjacent a moving member, and actuator means for effecting pivoting of said transfer head relative to said arm in response to pivoting of said arm; said actuator means including a first pulley fixed to said transfer head and movable about said second pivot axis, a second pulley mounted on said first pivot shaft and fixed against rotation about said first pivot axis, and belt means interconnecting said pulleys.

4,355,968

APPARATUS FOR PRODUCING HOLLOW PLASTIC BOTTLES BY THERMAL HEATING AND BLOW MOLD EXPANSION

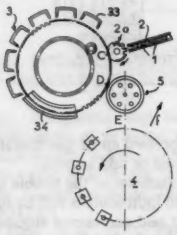
Serge Lagoutte, Buxy, and Alain G. Franchet, St. Etienne du Rouvray, both of France, assignors to Pont-A-Mousson S.A., Nancy, France

Filed Mar. 19, 1981, Ser. No. 245,305

Claims priority, application France, Mar. 26, 1980, 80 06668

Int. Cl.³ B29C *17/07*

U.S. Cl. 425—526 **11 Claims**



1. An installation for manufacturing hollow bodies, such as bottles, by thermally treating and then blow molding cylindrical blanks (1) made of a plastic material with one extremity closed and one extremity open forming a neck, said installation comprising:

(a) a thermal treatment station (3) including a turntable (9), a stationary table (32) surrounding said turntable, a plurality of heating devices (33) mounted around a peripheral portion of said stationary table, a plurality of blank support devices (15) mounted on the turntable and rotatable therewith in close proximity to said heating devices, and means for inverting said blank support devices when entering and leaving said peripheral portion of the stationary table mounting said heating devices such that blanks carried by said support devices have their neck openings directed upwardly outside said peripheral portion and downwardly inside said portion,

(b) a station (2, 2*a*) for individually supplying blanks to said support devices,

(c) a blow molding station (4), and

(d) a station (5) for transferring blanks from said support devices after leaving said peripheral portion to said blow molding station.

4,355,969

ELECTRICALLY CHARGED, EMULSIFIED CARRIER-FUEL PARTICLE COMBUSTION

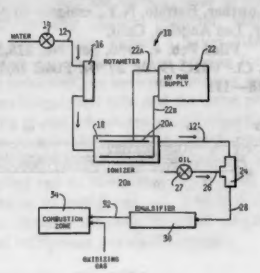
Kenneth L. Nelson, Traverse City, Mich., and David FitzGerald, North Hampton, Pa., assignors to FND Company, Traverse City, Mich.

Filed May 29, 1980, Ser. No. 154,390

Int. Cl.³ F23J *7/00*; F02M *7/00*; F02G *3/00*; C10L *1/32*

U.S. Cl. 431—4 **4 Claims**

1. A method of improving the combustion process between a fuel and an oxidizing gas in a combustion zone comprising the steps of creating negatively charged ions in water forming an emulsion of charged water and an oil fuel and introducing said emulsion as oil coated droplets, and an oxidizing gas into the combustion zone, heating the sroplets to cause said droplets to



explode and burst the oil fuel into dispersed oil fuel particles, and combusting the dispjersed oil fuel particles.

4,355,970

PRESSURE RESPONSIVE SAFETY VALVE FOR GAS BURNER

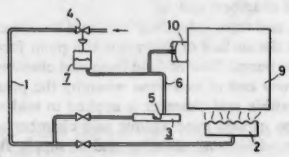
Kouichirou Kitagawa, Tokyo, and Eiichi Kanno, Yokohama, both of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Feb. 23, 1978, Ser. No. 880,665

Claims priority, application Japan, Feb. 23, 1977, 52/18860; May 2, 1977, 52/51070; Sep. 14, 1977, 52/110834; Dec. 9, 1977, 52/148584

Int. Cl.³ G05D *23/12*

U.S. Cl. 431—77 **6 Claims**



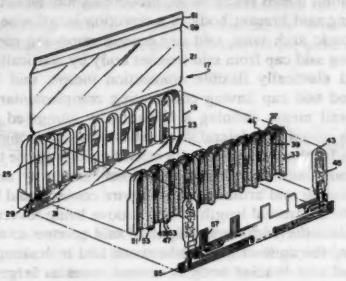
1. A safety device for a gas burner including an inflammable gas pipe and valve means disposed in said gas pipe, comprising: a first ignition means formed on an end portion of said gas pipe; an inflammable gas guide tube having one end facing first ignition means; a second ignition means formed on the other end of said guide tube; a branch pipe having one end connected to said gas pipe between said valve means and said first ignition means and the other end connected to burner means, said second ignition means facing said burner means; means for detecting the pressure in said guide tube comprising a pressure sensing device and a pressure sensing tube connected between a portion of said guide and said pressure sensing device, said pressure sensing tube being branched into two portions, one portion being connected to said pressure sensing device and the other portion being connected to an overheat-sensing valve on a vessel heated by said burner means; and means for controlling said valve means in response to a pressure variation in said guide tube.

4,355,971

VENTED MULTI-LAMP PHOTOFLASH UNIT

David R. Broadt, Lewisburg, and John W. Shaffer, Williamsport, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Dec. 29, 1980, Ser. No. 221,132
Int. Cl.³ F21K 5/02
U.S. Cl. 431—359 11 Claims



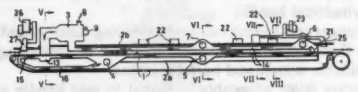
1. In a multi-lamp photoflash unit having a housing member with a back portion and a front portion, said back portion formed to provide a plurality of spaced cavities, each contoured to receive a flashlamp and said front portion having a light transmitting portion formed to fold over and enclose said flashlamps within said cavities, the improvement wherein a venting aperture is disposed intermediate at least one pair of said spaced cavities of said back portion of said housing.

4,355,972

TRAVELLING BAKING OVEN

John R. Stamper, Stamford, England, assignor to Baker Perkins Holdings Limited, Peterborough, England

Filed Feb. 17, 1981, Ser. No. 234,813
Claims priority, application United Kingdom, Feb. 19, 1980, 8005599
Int. Cl.³ F27B 5/04; A23L 3/00; F27B 3/22
U.S. Cl. 432—148 7 Claims



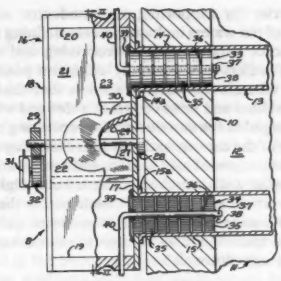
1. A multi-zone, indirect-heated, travelling baking oven, comprising: means defining a tunnel-like baking chamber; means for conveying articles to be baked through the baking chamber along a path of travel from an input end thereof to a delivery end thereof; gas duct means defining a closed-circuit gas heating system and conducting the gas flow beneath at least the major part of said path to adjacent said delivery end and then back above at least the major part of said path; fan means for passing said gas flow around said gas duct means beneath said path generally in the same direction as said conveying means and above said path generally in the opposite direction to said conveying means; and at least two heaters associated with said duct means for heating the gas in said heating system and spaced apart in the direction of gas flow in said heating system, one said heater being adjacent said input end of the oven and of much larger capacity than the, or each, further said heater, whereby the temperature generally falls throughout said heating system for adjacent said input end below said path to adjacent said input end above said path and the maximum bottom heat is adjacent said input end and the maximum top heat is adjacent said delivery end, thereby providing a multi-zone, indirect-heated baking chamber.

4,355,973

RADIANT HEATING APPARATUS

John M. Bailey, Dunlap, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US81/00210, § 371 Date Feb. 17, 1981, § 102(e) Date Feb. 17, 1981
PCT Filed Feb. 17, 1981, Ser. No. 277,747
Int. Cl.³ F27B 5/14; F24C 3/00
U.S. Cl. 432—209 12 Claims



1. In a radiant heating apparatus of the type which has wall means (10,11) of substantial thickness defining a chamber (12) to be heated, a tube (13) in the chamber with first and second end portions (14,15) extending through the wall means (10,11) fuel gas supply pipes (40,210) and air inlet means (16,121,221) through which a combustible air-fuel mixture is supplied to the tube to be burned therein, and combustion gas outlet means (24/25,124,224) through which combustion products from the tube pass, the improvement comprising:

first and second regenerator cores (33/34,233,234) in the respective first and second end portions (14,15) of the tube (13), each of said cores having an outer end and an inner end, having a large surface area over which gases may flow freely, and occupying substantially the entire portions of the tube that are within the thickness of the wall means;

fuel gas supply pipes (40,210) for supplying fuel gas to the tube (13) adjacent both end portions (14,15) thereof;

air inlet means (16,121,221) for supplying combustion air to both end portions (14,15) of the tube (13);

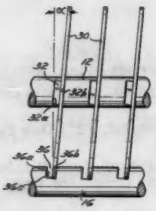
and cycling means (30/126/226,299) to control flow of fuel gas and air into the tube (13) to be burned therein, said cycling means causing combustion air to flow through the first regenerator core (33,233) and causing gas to flow to be mixed with said combustion air and burned inwardly of said first core (33,233), thereby producing hot combustion products which heat the second regenerator core (34,234) as they pass to the outlet means (24/25,124,224) and said cycling means then causing combustion air to be heated as it flows through the heated second regenerator core (34,234), to be combined with fuel gas and burned immediately inwardly of said second core (34,234), thereby producing hot combustion products which flow over and heat the first regenerator core (33,233) as they pass to the outlet means (24/25,124,224).

4,355,974

WAFER BOAT

Eui-Wan Lee, Eggertsville, N.Y., assignor to ASQ Boats, Inc., Torrance, Calif.

Filed Nov. 24, 1980, Ser. No. 209,905
Int. Cl.³ B05C 13/02
U.S. Cl. 432—253 10 Claims



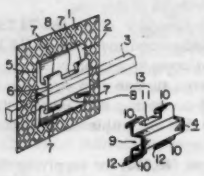
1. A carrier for supporting semiconductor wafers during processing of the wafers including means defining a plurality of closely spaced, parallel slots for receiving and supporting a plurality of wafers in a generally edgewise position, the improvement wherein the width of a slot is such that a wafer can be easily installed and removed from a slot and will at no time become wedged in the slot during the processing of the wafers or handling of the carrier, and said slots including side slots for engaging side edges of said wafers and which are formed by spaced, parallel walls which are oriented at a slight angle with respect to vertical and the wafers each lean in the same direction against a corresponding wall in each slot and thereby are supported in spaced parallel relation to each other at the same angle as the side slot wall angle.

4,355,975

ORTHODONTIC APPLIANCE

Kinya Fujita, No. 326, Nagasawa, Yokosuka-shi, Kanagawa-ken, Japan

Filed Dec. 15, 1980, Ser. No. 216,736
Claims priority, application Japan, Feb. 8, 1980, 55-14414
Int. Cl.³ A61C 7/00
U.S. Cl. 433—11 9 Claims



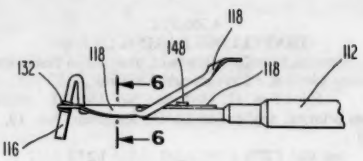
1. In an orthodontic appliance comprising an upright plate adapted to be fixed to a tooth, a bracket having a surface fixed to said plate and a bracket body extending laterally away from said plate, and an orthodontic arch wire attachable to said bracket body and effective for correcting improper positioning of the tooth, the improvement which comprises the combination: said bracket body has cap-retaining means which are accessible from a direction substantially perpendicular to the lengthwise extent of said orthodontic arch wire, said cap-retaining means being defined by a pair of lips respectively projecting upwardly and downwardly from said bracket body, said lips being undercut on the sides thereof that face said plate so that each lip has an enlarged protuberance at the outer end thereof; an elastically flexible cap removably attached to said bracket body, said cap having elastically flexible connection means releasably interlocked with said cap-retaining means, said elastically flexible connection means being defined by elastic wall portions at the upper and lower ends of said cap with the edges of said elastic wall portions being bent toward each other so that they releasably snugly embrace said enlarged protuberances of said lips, said cap being attachable to and removable from said bracket body by elastic bending of said elastically flexible connection means when said cap is moved in directions respectively toward and away from said cap-retaining means, said bracket body and said cap having cooperating means effective for preventing movement of said cap along said bracket body in a direction lengthwise of said orthodontic arch wire, said cap having removing means for detaching said cap from said bracket body by elastically bending said elastically flexible connection means; said bracket body and said cap having cooperating complementary elongated wall means defining a horizontally elongated groove which is closed at its lateral sides and is open at its longitudinal ends, said orthodontic arch wire extending lengthwise through said groove and being snugly confined therein by said wall means so that said orthodontic arch wire contacts said bracket body, the horizontal length of said groove being several times larger than the width and height of said groove so that the length of the zone of contact between said orthodontic arch wire and said bracket body is several times as large as the width of said orthodontic arch wire.

4,355,976

AMALGAM CARRIER WITH UNITARY SPRING LEVER MEMBER

Vincent A. Berner, Middleton, N.J., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Sep. 30, 1981, Ser. No. 306,993
Int. Cl.³ A61C 3/08
U.S. Cl. 433—83 8 Claims



1. A dental amalgam carrier comprising
an open-ended barrel member for carrying said amalgam,
a cylindrical handle,
a plunger rod having one end extending axially rigidly from a first end of said handle, free end of said plunger rod slidable within said barrel member,
a spring lever adjustably mounted to said handle adjacent said first end thereof in longitudinal alignment therewith, said spring lever having an opening at a forward portion thereof for engaging said barrel while said barrel is carrying said free end of said plunger rod therein,
said spring lever comprising an unitary member devoid of separate spring means coacting therewith such that depression of said spring lever causes said free end of said plunger rod to transfer amalgam from said barrel member, and said spring lever returns to its undepressed position.

4,355,977

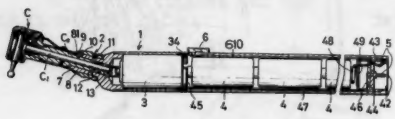
CORDLESS HANDPIECE FOR DENTAL TREATMENT

Sadayasu Ota, Kyoto, and Takeo Uchiya, Oomiya, both of Japan, assignors to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

Filed Sep. 30, 1980, Ser. No. 192,606
Claims priority, application Japan, Oct. 8, 1979, 54-140098[U]
Int. Cl.³ A61C 1/06
U.S. Cl. 433—131 2 Claims

1. A cordless handpiece for dental treatment with replace-

ment contra angle and straight tools, comprising a joint mounted on the tip portion of a handpiece body so as to replaceably attach and detach a straight tool or a contra angle tool to and from the tip portion, a coreless motor housed in said handpiece body and connected directly to a driving shaft of said straight tool or to a driving shaft of said contra angle tool, storage battery housed in said handpiece body for driving said coreless motor, an electrode likewise housed in the distal end of said handpiece body for charging said batteries and a switch for controlling turning on and off said motor, wherein said motor, batteries and electrode are located on the same axis and



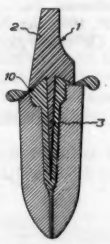
said joint comprises a set sleeve fitted rotatably over a sleeve at the tip portion of said handpiece body, a ball groove provided at one end of said sleeve circumferentially of the sleeve passing through the thickness of said sleeve, a locking ball nesting in said groove and adapted to bring the lower end thereof into abutment against the housing of said straight tool for the housing of said contra angle tool, an eccentric groove corresponding to said locking ball and formed on the inner surface of said sleeve, and a set screw passing through the thickness of said sleeve and set in the thickness of said sleeve whereby said contra angle and straight tools are readily replaceable by loosening said set screw and rotating said set sleeve.

4,355,978

PATRIX FOR THE PRODUCTION OF A GOLD CORE FOR A PREPARED ROOT-FILLED TOOTH

Dan W. Ericson, Ehrensvärdsgatan 6, S-212 13 Malmö, Sweden

Filed Oct. 16, 1980, Ser. No. 197,705
Claims priority, application Sweden, Oct. 16, 1979, 7908538
Int. Cl.³ A61C *5/08*
U.S. Cl. 433—220 **1 Claim**



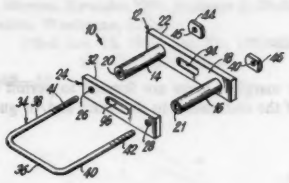
1. A core patrix for the production of a gold core for a prepared root-filled tooth having a root canal, said core patrix comprising: a single piece made from a gasifiable material, said single piece having a core portion and a dowel portion, said core portion corresponding to and defining the shape of the upper part of the finished gold core, said dowel portion having a substantially smaller thickness than the root canal, said patrix, after the insertion of said dowel portion in a root canal filled with a gasifiable impression material and after setting of said impression material on said dowel portion, together with said impression material will form a core pattern from which the gold core is cast, said core portion including a recessed portion facing said dowel portion and the root canal, said recessed portion confining said impression material to said dowel portion.

4,355,979

LINGUAL DENTAL SPLINT DEVICE

Bernard Weissman, New York, N.Y., assignor to Ipco Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 70,247, Aug. 27, 1979, Pat. No. 4,260,383. This application Sep. 18, 1980, Ser. No. 188,356
The portion of the term of this patent subsequent to Apr. 14, 1998, has been disclaimed.
Int. Cl.³ A61C *5/04*
U.S. Cl. 433—225 **8 Claims**



1. A dental splinting device comprising:
an elongated bar-like body member disposable in a side wall channel laterally extending between adjacent teeth;
retaining means extending outwardly from said body member for being disposed in bores provided transversely in the adjacent teeth through a base wall of the side wall channel, said retaining means positioning said body member against the adjacent teeth when said body member is in a final position in the channel;
said retaining means including two tubular members extending perpendicularly from said body member for being received in the bores of the adjacent teeth;
said tubular members including guide means for guiding a drill during formation of a pilot hole through each of the adjacent teeth when said body member is initially positioned in the channel with said tubular members extending outwardly from the base wall of the channel, the pilot holes functioning as lead holes for formation of the bores in the adjacent teeth;
said guide means including an axial opening extending through each of said tubular members and through said body member;
clamping means disposable in an opposing side wall channel laterally extending between the adjacent teeth, said clamping means passing through said axial openings of said tubular members and engaging said elongated body member for securing said elongated body member in the adjacent teeth;
said clamping means including a U-shaped wire having legs respectively extending from the opposing side wall of the teeth through said tubular member axial openings to the other side of said elongated body member, with a bight portion of said wire being disposable in the opposing side wall channel, said legs being provided with restraining means at distal end of each leg of said U-shaped wire for holding said body member firmly in place in the adjacent teeth.

4,355,980

METHOD OF FORMING DENTAL RESTORATIONS

Owen Dwight, 440 Calle Madrigal, Cathedral City, Calif. 92234

Filed Nov. 17, 1980, Ser. No. 207,410
Int. Cl.³ A61C *5/04*
U.S. Cl. 433—226 **3 Claims**

1. A method of forming dental restorations which comprises incorporating within a mold cavity conforming to the shape of the desired restoration finely divided particles of gold or relatively soft gold alloy only along an area corresponding to the exposed marginal area of the restoration contiguous to the tooth or gum, and thereafter casting within said cavity a rela-

tively harder dental alloy, said particles and said harder alloy becoming bonded together to form a composite structure in

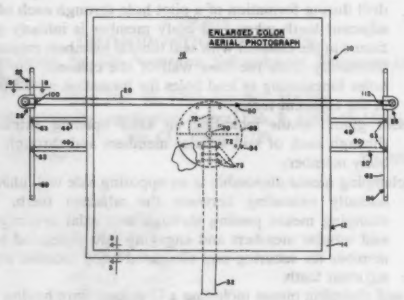
which softer marginal areas are formed to permit improved adaptation of the restoration to the tooth and/or gum.

4,355,981

COLOR MOVING TARGET SIMULATION APPARATUS

Gilbert G. Kuperman, Dayton, and Reuben L. Hann, Fairborn, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 12, 1981, Ser. No. 272,835
Int. Cl.³ G09B 9/00
U.S. Cl. 434—14 5 Claims



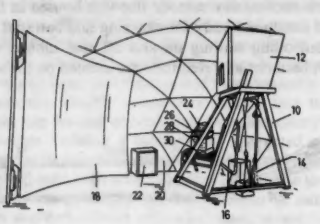
1. Color moving target simulation apparatus, comprising:
a. a substrate having generally planar front and rear sides;
b. an enlarged color aerial photograph mounted on said front side of said substrate;
c. an arm supported adjacent to said rear side of said substrate and having opposite ends which extend beyond the periphery of said substrate, said arm being mounted intermediate its opposite ends for rotatable adjustment to different positions in a plane generally parallel to said planar sides of said substrate;
d. a motorized assembly mounted at said opposite ends of said arm and including a wire extending therebetween for movement along a generally linear path across said front side of said substrate and said photograph mounted thereon; and
e. a target of a size proportioned to the scale of said aerial photograph and being attached to said wire for movement therewith across said front side of said substrate and said photograph mounted thereon.

4,355,982

HANG GLIDER FLIGHT SIMULATOR

Christopher James, Sydney, Australia, assignor to Arthur Sydney Herbert, Plimmerton, New Zealand

Filed Nov. 24, 1980, Ser. No. 210,025
Int. Cl.³ G09B 9/02
U.S. Cl. 434—30 14 Claims



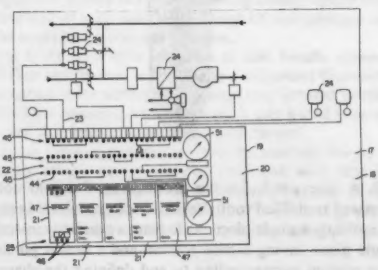
1. A hang glider flight simulator comprising:
A. a pilot suspending means,
B. a control means,
C. means from which said pilot suspending means and control means are suspended,
D. means associated with said means from which said pilot suspending means and control means are suspended for maneuvering said pilot suspending means and said control means to simulate movements occuring during hang gliding,
E. visual display means positioned to be viewed by a pilot in said pilot suspending means, and
F. means for synchronizing said means for maneuvering with said visual display means so that in use movements simulated by said means for maneuvering correspond to images displayed by said visual display means.

4,355,983

CONTROL PANEL LAYOUT SHEET AND METHOD OF MAKING THE SAME

Clarence M. Asbill, III, Richmond, Va., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Mar. 30, 1981, Ser. No. 248,720
Int. Cl.³ G09B 29/00
U.S. Cl. 434—219 40 Claims



1. In a method of making a control panel layout sheet having on one side thereof first means indicating control devices that are to be mounted on a control panel to be made from said sheet, second means indicating the external pneumatic lines that are to be interconnected to said devices, and third means indicating the external electrical lines that are to be interconnected to said devices whereby said layout sheet is adapted to be utilized as a guide for constructing a control panel having said control devices and said external pneumatic and electrical lines thereon, the improvement comprising the step of dispos-

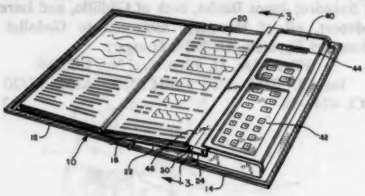
ing said means on said sheet in substantially the exact location thereon that the control devices and external pneumatic and electrical lines will take in the respective control panel to be made therefrom so that said layout sheet substantially simulates a completed control panel when facing the same.

4,355,984

TEACHING DEVICE

William H. Slavik, Palos Hills; William P. Carlson, Chicago, and Michael J. McGowan, Downers Grove, all of Ill., assignors to Nuvatec, Inc., Lombard, Ill.

Filed Mar. 25, 1980, Ser. No. 133,850
Int. Cl.³ G09B 7/02, 7/06
U.S. Cl. 434—335 24 Claims



1. A teaching device comprising:

means for automatically sensing an encoded text key and generating in response thereto a digital seed;

means, responsive to the seed, for automatically performing an arithmetic calculation on the seed to generate a unique set of digital answer key signals indicative of a sequence of correct answers, at least some of said correct answers corresponding to respective questions associated with said text key;

means for registering a manually generated answer signal indicative of a proposed answer to a selected one of said questions; and

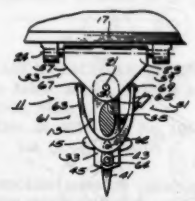
means for automatically comparing the manually generated answer signal with the set of answer key signals to determine whether the proposed answer corresponds to the respective correct answer.

4,355,985

MARINE PROPULSION DEVICE WITH SELF-CENTERING STEERING MECHANISM

Gaylord M. Borst, and Frank J. Walsworth, both of Waukegan, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Dec. 8, 1980, Ser. No. 213,996
Int. Cl.³ B63H 25/42
U.S. Cl. 440—51 7 Claims



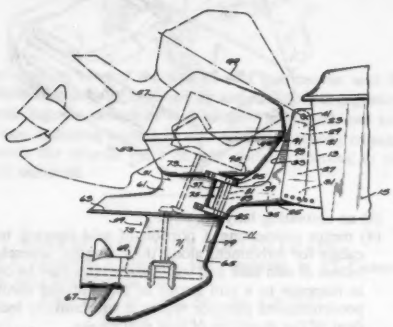
1. A marine propulsion device comprising a lower unit, means on said lower unit adapted for connecting said lower unit to the transom of a boat for steering movement about a steering axis, means on said lower unit adapted for steerably displacing said lower unit about the steering axis relative to a fore and aft position, a trim tab, means mounting said trim tab on said lower unit rearwardly of the steering axis for pivotal movement relative to a position aligned fore and aft with said lower unit, and means connected to said trim tab and responsive to pivotal steering displacement of said lower unit for pivotally displacing said trim tab relative to said lower unit in the same pivotal direction as steering displacement of said lower unit.

4,355,986

OUTBOARD MOTOR WITH ELEVATED HORIZONTAL PIVOT AXIS

Myron T. Stevens, Kenosha, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Jun. 16, 1980, Ser. No. 159,480
Int. Cl.³ B63H 21/26
U.S. Cl. 440—53 40 Claims



33. An outboard motor comprising a transom bracket adapted to be fixed to the transom of a boat, a unitary swivel bracket, a tilt pin directly pivotally connecting said swivel bracket and said transom bracket rearwardly of the transom for tilting movement of said swivel bracket relative to said transom bracket between a normal operating position and a raised tilt position and about a tilt axis which is generally horizontal when said transom bracket is fixed to the boat transom, a propulsion unit including a lower unit and a powerhead secured to said lower unit below the tilt axis, and means including a king pin located wholly below the tilt axis and connecting said propulsion unit and said swivel bracket for pivotal steering movement of said propulsion unit relative to said swivel bracket about an axis transverse to the tilt axis, and such that said propulsion unit only pivots about the transverse axis with respect to said swivel bracket.

4,355,987

LIFE RAFT INFLATION SYSTEM

David D. Miller, Bricktown, N.J., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Oct. 15, 1980, Ser. No. 196,730
Int. Cl.³ B63C 9/24
U.S. Cl. 441—41 29 Claims

1. An inflatable life raft apparatus comprising:

(a) a raft body having first and second inflatable sections;

(b) first inflation means mounted on said raft body for inflating said first section thereof;

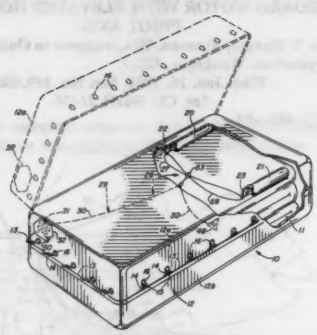
(c) second inflation means mounted on said raft body for inflating said second section thereof, said first and second inflation means each including a tank and valve assembly; and

(d) pull means, interconnected between said first and second inflation means, for manually actuating either or both of said first and second inflation means, said pull means including means responsive to inflation of one of said raft body sections for automatically actuating the inflation means of the other section in the event that only the infla-

tion means of said one of said raft body sections is manually actuated by said pull means, said pull means further including:

(1) a pair of valve release cables operatively connected to the valves of said tank and valve assemblies and extending between said tank and valve assemblies, said inflation responsive means including one of said cables,

(2) means restraining movement of outer end portions of said cables relative to said raft body,



(3) an activating lanyard, and

(4) means connecting a portion of said lanyard to said cables for movement along their lengths, whereby the valves of said tank and valve assemblies may be opened in response to a pull stroke of said lanyard through a predetermined distance which is substantially independent of the direction of said pull stroke.

4,355,988

TRACK ROLLER FOR TRACK-LAYING VEHICLES

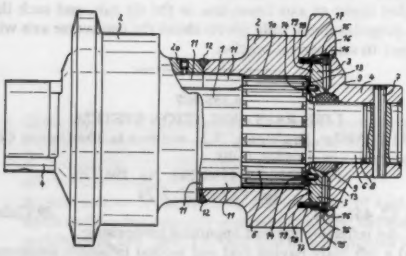
Helmuth Klaus, Hagen-Haspe; Heinz Lause, Recklinghausen, and Hansjoachim Brunn, Damme, all of Fed. Rep. of Germany, assignors to Firma Intertractor Viehmann GmbH & Co., Fed. Rep. of Germany

Filed Jun. 26, 1980, Ser. No. 163,062

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1979, 2927173

Int. Cl.³ B62D *55/00*

U.S. Cl. 474—91 **4 Claims**



1. Track roller for excavators and other track-laying vehicles, consisting of a shaft, a roller body rotatably supported thereon, caps limiting the axial relative movement of shaft and roller body and end pieces axially spaced from each other for the firm attachment of the track roller to the frame, the shaft in its center having a relatively large diameter laterally thereof, relatively wide cylindrical bearing surfaces of larger diameter and on its sides ends of reduced diameter, elastic packings disposed at suitable locations between the shaft ends and the end pieces, between the end pieces and the caps, and between the caps and the roller body, an antifriction metal washer provided between the shaft and the caps, respectively, the feeding of oil to those packings which must be lubricated taking place from an oil space which is arranged between the bearing surfaces of the shaft and which serves as an oil reservoir, the roller body having a shaft-receiving opening which extends approximately uniformly over its entire width and is substantially free of steps, plain bearings for the bearing surfaces of the shaft being arranged directly in the ends of the roller body.

4,355,989

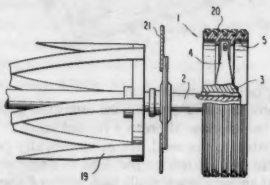
GEAR UNIT FOR POWER-SAVING DRIVE OF WORKING ELEMENTS OF ROTARY OR OSCILLATORY MOTION, ESPECIALLY OF AGRICULATURAL CUTTER DRUMS AND PEG DRUMS

Peter Szendro; Janos Benko, both of Gödöllo, and Imre Szabo, Budapest, all of Hungary, assignors to Godolloi Agrartudomanyi Egyetem, Gödöllo, Hungary

Filed Mar. 31, 1980, Ser. No. 135,269

Int. Cl.³ F16D *3/66*; F16H *55/36*; A01D *55/20*

U.S. Cl. 474—94 **2 Claims**



1. An agricultural cutter comprising a cutter drum, a shaft on which said cutter drum is mounted for rotation, a hub on the shaft, a V-belt pulley having a peripheral crown surrounding the hub, a plurality of spokes on the hub extending radially outwardly from the hub toward the crown, and spring means between the spokes and the crown for momentarily storing and then releasing energy during the cutting of an agricultural product.

4,355,990

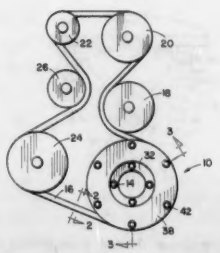
TORSIONALLY ELASTIC POWER TRANSMITTING DEVICE

Jock S. Duncan, Jr., Parker, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed Sep. 22, 1980, Ser. No. 189,493

Int. Cl.³ F16H *55/14*

U.S. Cl. 474—94 **9 Claims**



5. A torsional vibration dampener comprising:

a cup-shaped hub member having at least two lugs;

elastomeric cushion members positioned adjacent the lugs and capable of dampingly transmitting power; and

an outer rim member having at least two radially inwardly extending ears adapted to matingly engage the lugs through said cushions interposed therebetween;

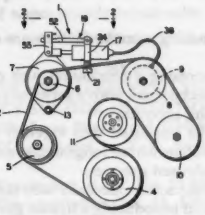
said rim and cup-shaped hub members having along their respective inner and outer peripheries radial bearing surfaces which in themselves tend to axially self-align the dampener in use.

4,355,991

ARRANGEMENT FOR TENSIONING THE DRIVE BELT FOR VEHICLE ACCESSORIES

Derald H. Kraft, Canton, Ohio, assignor to Dyneer Corporation, Canton, Ohio

Filed Aug. 3, 1979, Ser. No. 63,193
Int. Cl.³ F16H 7/14
U.S. Cl. 474—110 7 Claims



1. An arrangement for tensioning an endless drive belt of a vehicle engine accessories drive system including:

(a) a vehicle accessory pivotally mounted with respect to the vehicle engine and operatively engaged with and driven by the endless drive belt;

(b) piston means operatively engaged with the said vehicle accessory for pivotally moving said accessory to a tensioning position and for applying a predetermined tensioning force on the drive belt engaged therewith;

(c) fluid supply means communicating with the piston means for hydraulically actuating said piston means to pivot the vehicle accessory to the belt tensioning position and to apply the predetermined tensioning force on the drive belt; and

(d) ratchet-pawl means operatively engageable with the said accessory, said ratchet-pawl means including:

(i) a ratchet bar having a series of teeth formed thereon,

(ii) a pivotally mounted pawl having a projection which operatively engages individual teeth of the ratchet bar, and

(iii) a spring biasing the pawl projection toward engagement with the ratchet bar teeth to maintain the accessory in the belt tensioning position and to maintain the predetermined tensioning force on the belt during a decrease in hydraulic pressure on the piston means.

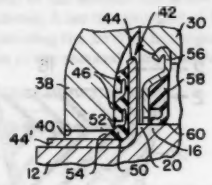
4,355,992

ROTATABLE MACHINE ASSEMBLY

Eli M. Ladin, Ann Arbor, Mich., assignor to Federal-Mogul Corporation, Detroit, Mich.

Filed Dec. 26, 1979, Ser. No. 106,592
Int. Cl.³ F16H 7/06
U.S. Cl. 474—152 11 Claims

1. A rotatable machine assembly comprising; hub means having an axis, casing means extending radially of said axis of said hub means to a circular periphery, bearing means interconnecting said hub means and said casing means for allowing relative rotation between said casing means and said hub means about said axis, said casing means including annular axially spaced side walls with one of said side walls on one side of said bearing means, and the other of said side walls on the other side of said bearing means, said side walls each having a circular opening surrounding and in close spaced relationship to said hub means, a pair of annual seal means non-rotatably supported by said hub means on opposite sides of said bearing means, and annular support portion extending radially of said axis from said hub means and spaced axially inwardly from said interior surface of the adjacent side wall, said seal means including at least one annular lip extending at an acute angle from said



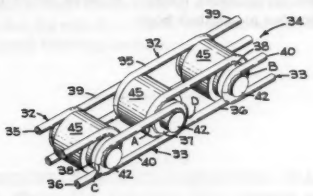
support portion toward the axis of said hub means, said lip being deflected radially inwardly by and in sliding engagement with said interior surface of said adjacent side wall, and said seal means including an annular pad portion in sealing engagement with the interior edge of said circular opening in the adjacent sidewall.

4,355,993

WELDED WIRE LINK ROLLER CHAIN

Ronald F. Homeier, Plainfield, Ind., assignor to PT Components, Inc., Indianapolis, Ind.

Filed Mar. 10, 1980, Ser. No. 129,062
Int. Cl.³ F16G 13/07
U.S. Cl. 474—231 11 Claims



1. In a power transmission chain of the type in which alternate inner and outer link units are interconnected to form the chain, the improvement wherein at least one of said link units comprises a pair of spaced generally parallel side links formed from bent wire having its end portions welded to each other, and a pair of pins extending transversely between said side links near the opposite ends thereof and secured thereto by filler type welding.

4,355,994

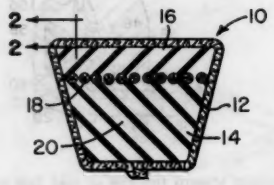
COVERED V-BELT HAVING REDUCED COEFFICIENT OF FRICTION SIDES AND METHOD OF MAKING THE SAME

James K. Brew, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Filed May 6, 1980, Ser. No. 147,431
Int. Cl.³ F16G 5/16
U.S. Cl. 474—270 4 Claims

1. In a wrapped, molded V-belt having outside surfaces and comprising a belt body made primarily of elastomeric material and having a cover which covers the entire peripheral outline of said belt body, said cover comprising an inner layer of elastomeric material, an outer layer of elastomeric material, and a fabric disposed between said layers, said inner layer being secured to said belt body at said entire peripheral outline thereof and said outer layer defining said outside surfaces of

said V-belt, the improvement wherein only said outer layer of said cover has a finely comminuted metallic material intimately mixed with said elastomeric material thereof to provide a



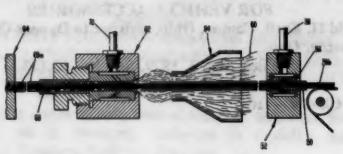
reduced coefficient of friction for said outside surfaces of said V-belt and said inner layer of said cover is substantially free of said finely comminuted metallic material while being tenaciously bonded to said belt body.

4,355,995

TOBACCO SMOKE FILTER PROVIDING TOBACCO FLAVOR ENRICHMENT, AND METHOD FOR PRODUCING SAME

Richard M. Berger, Midlothian, Va., assignor to American Filtrona Corporation, Richmond, Va.

Division of Ser. No. 24,251, Mar. 27, 1979, Pat. No. 4,291,711.
This application Apr. 3, 1981, Ser. No. 250,839
Int. Cl.³ A24D *3/02, 3/06*
U.S. Cl. 493—43 11 Claims



1. A method of making a smoke filter means comprising the steps of:

(a) uniformly embossing a continuous web of coherent reconstituted tobacco sheet with a series of parallel longitudinally extending grooves;

(b) compacting the embossed web together into an axially elongated formation whose longitudinal axis extends parallel to said embossed grooves;

(c) passing the compacted embossed web through a heated confined area and introducing a heated gas into said compacted embossed web during its passage through said confined area, thereby bonding the compacted embossed web into a self-sustaining dimensionally stable axially elongated reconstituted tobacco body constituting at least a concentric portion of a filter rod; and

(d) transversely cutting said filter rod into segments of suitable length for use as filter elements.

4,355,996

AZO DYE REDUCTION IMPROVEMENT OF LIGNIN

Peter Dilling, Isle of Palms, and Gerald Prazak, Charleston, both of S.C., assignors to Westvaco Corporation, New York, N.Y.

Division of Ser. No. 133,505, Mar. 24, 1980, which is a continuation-in-part of Ser. No. 126,294, Mar. 3, 1980, abandoned. This application Mar. 4, 1981, Ser. No. 240,279

Int. Cl.³ C09B 9/00, 67/30, 67/10, 67/40

U.S. Cl. 8—561 10 Claims

1. In a process for making a dyestuff composition with improved fiber staining including the combining of a disperse or vat dye cake and a sulfonated lignin dispersant, the improvement comprising first modifying the sulfonated lignin dispersant by reacting an aqueous solution of a sulfonated lignin at a solids concentration of from 5% to 35% with from 0.01 to 0.5 mole, per 1,000 grams of lignin, of a compound selected from the group consisting of water soluble salts of the divalent metals Mg^{2+}, Ca^{2+}, Zn^{2+}, Cd^{2+}, Sr^{2+}, Ba^{2+}, Ni^{2+}, Cr^{2+} and Mn^{2+} and water soluble borate salts.

4,355,997

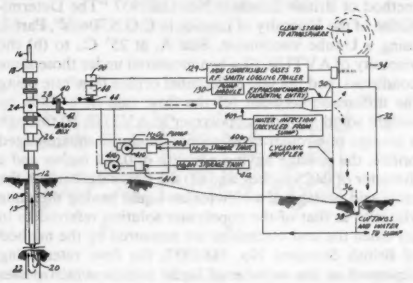
METHOD FOR MEASURING THE LEVEL OF HYDROGEN SULFIDE IN GEOTHERMAL STEAM

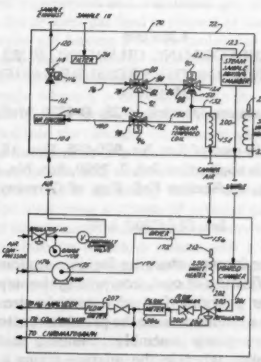
Robert F. Smith, Long Beach, and Dwight E. Walters, Cobb, both of Calif., assignors to R. F. Smith Corp., Lakewood, Calif.

Continuation-in-part of Ser. No. 80,684, Oct. 1, 1979, abandoned. This application Jun. 15, 1981, Ser. No. 273,951

Int. Cl.³ G01N 33/24, 33/18

U.S. Cl. 23—230 EP 8 Claims





1. A method for continuously measuring the amount of hydrogen sulfide present in a continuous gaseous stream of steam containing hydrogen sulfide as a pollutant produced from a geothermal formation, the method comprising the steps of:

keeping the gaseous stream above its dew point;

mixing the gaseous stream of steam with a continuous stream of dilution gas in a fixed predetermined ratio by volume to lower the dew point of the gas mixture, the dilution gas being substantially free of said pollutant, keeping the temperature of the mixed gas stream at a temperature above the lowered dew point of the mixture but below the dew point of the gaseous stream from the geothermal formation, and continuously measuring the level of hydrogen sulfide in the mixed gas stream at the reduced temperature.

4,355,998

REAGENT FOR THE QUANTITATIVE DETERMINATION OF WATER AND ITS USE THEREFOR

Antonie E. Verbeek, Bathmen, and Jozef M. J. Mattheij, Deventer, both of Netherlands, assignors to J. T. Baker Chemicals B.V., Deventer, Netherlands

Filed Aug. 14, 1981, Ser. No. 292,880

Claims priority, application European Pat. Off., Sep. 2, 1980, 80105224.2

Int. Cl.³ G01N 33/18

U.S. Cl. 23—230 R 17 Claims

1. In a reagent for the quantitative determination of water, used together with an iodine-containing titrating solution, the reagent containing sulfur dioxide and anhydrous alkali metal carboxylic acid salt in an anhydrous lower monohydric aliphatic alcohol as solvent, the improvement wherein the lower monohydric aliphatic alcohol is 2-methoxy ethanol, methanol or a mixture of both compounds in a volume ratio of at least 10:90 and that the anhydrous alkali metal carboxylic acid salt is an alkali metal trimethyl acetate.

4,355,999

PROCESS FOR AGGLOMERATING COAL

George P. Masologites, Columbus, N.C., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Filed Dec. 20, 1978, Ser. No. 971,157

Int. Cl.³ C10L 9/00, 5/10

U.S. Cl. 44—1 SR 11 Claims

1. A method for reducing the amount of oil required to form coal-oil agglomerates comprising the steps of:

(a) forming a slurry of water and coal particles;

(b) contacting the slurry with an amount of hydrocarbon oil to form coal-oil agglomerates;

(c) contacting said agglomerates with an additional amount of coal particles to form coal-oil agglomerates of a desired size consist; and

(d) recovering coal oil agglomerates of reduced oil content.

5. A process for beneficiating coal comprising the steps of:

(1) forming an aqueous slurry of coal particles containing ash and iron pyrite mineral matter; and hydrocarbon oil;

(2) agitating the slurry to form coal-oil agglomerates;

(3) recovering coal-oil agglomerates wherein the coal has reduced mineral content;

(4) forming a mixture of the recovered coal-oil agglomerates, water and an additional amount of coal particles containing ash and iron pyrite mineral matter;

(5) agitating the mixture to form coal-oil agglomerates reduced in mineral content; and

(6) recovering coal-oil agglomerates wherein the coal has reduced mineral content.

4,356,000

SOLID WASTE DERIVED FUEL

Christopher L. Chappell, Lichfield, Great Britain, assignor to Leigh Interests Limited, Birmingham, England

Continuation of Ser. No. 74,101, Sep. 10, 1979, abandoned. This application Nov. 12, 1980, Ser. No. 206,171

Claims priority, application United Kingdom, Sep. 15, 1978, 36983/78

Int. Cl.³ C10L 5/12, 5/48

U.S. Cl. 44—1 D 9 Claims

1. A method of manufacturing a solid storable pulverizable fuel with a substantially consistent calorific value, said method comprising the successive steps of:

(a) coating particles of a finely divided aluminum silicate based substance with a mobile waste of appreciable calorific value by mixing the waste, in the presence of water, with particles of the finely divided aluminum silicate based substance to provide a substantially homogenous mixture of finely divided particles coated with the waste, and thereafter

(b) solidifying the homogenous mixture of step (a) by the incorporation of a hydraulic cement in an amount sufficient to produce the solid storable pulverizable fuel.

8. A solid storable pulverizable fuel of substantially consistent calorific value produced by the process of claim 1.

4,356,001

METHOD OF EXTENDING HYDROCARBON FUELS INCLUDING GASOLINES AND FUELS HEAVIER THAN GASOLINE

William M. Sweeney, Wappingers Falls, and Sheldon Herbstman, Spring Valley, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Jun. 2, 1980, Ser. No. 155,351

Int. Cl.³ C10L 1/02

U.S. Cl. 44—56 15 Claims

1. The method of extending a hydrocarbon fuel which comprises

mixing (i) a liquid hydrocarbon fuel and (ii) an ether-alcohol mixture formed by etherifying an oxo-alcohol mixture with a C-4 or C-5 iso-olefin, thereby forming a single phase extended liquid hydrocarbon fuel characterized by improved water tolerance; and

recovering said single phase extended liquid hydrocarbon fuel characterized by improved water tolerance.

4,356,002

ANTI-STATIC COMPOSITIONS

J. Irvine Knepper, Manchester, and Dennis C. Sallee, St. Louis, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Dec. 11, 1978, Ser. No. 968,327

Int. Cl.³ C10L 1/22

U.S. Cl. 44—62 16 Claims

1. An antistatic composition comprising a surfactant and an antistatic agent selected from the group consisting of (1) t-dodecylamine amide-salt of tetradecene-1/maleic anhydride copolymer, (2) a mixture of olefin/sulfur dioxide copolymer and a polymeric polyamine derived from the reaction of an amine with epichlorohydrin, (3) 1-decene/sulfur dioxide copolymer, (4) polymeric ester/amide made from tetradecene-1/maleic anhydride copolymer, C_{18} alcohol, and N-cyclohexyl-2,4-diamino-2-methyl pentamine, and (5) a mixture of chromium alkylsalicylate, calcium didecyl sulfosuccinate, and a methacrylate/methyl vinyl pyridine copolymer.

4,356,003

COPOLYMERS

Herbert Brooks, Twyford, and Frederick A. Waite, Farnham Common, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Feb. 25, 1980, Ser. No. 124,251

Claims priority, application United Kingdom, Mar. 19, 1979, 7909483

Int. Cl.³ C10L 1/22

U.S. Cl. 44—62 11 Claims

1. A copolymer of (i) at least 75% by weight of tertbutylstyrene, (ii) from 1% to 24% by weight of a monomer selected from the group consisting of the acrylic and methacrylic esters of aliphatic monohydric alcohols containg from 1 to 4 carbon atoms, 2-ethoxyethyl methacrylate, acrylonitrile, vinyl acetate, styrene and vinyl toluene, and (iii) from 1% to 10% by weight of methacrylic acid, the total amount of monomers (i), (ii) and (iii) being 100%, the copolymer having the following characteristics:

(A) solutions of the copolymer in AVTUR 50 aviation kerosene, at all concentrations in the range 0.05% to 1% by weight, are, notwithstanding that they may appear hazy or opalescent, nevertheless homogeneous in the sense that no gross separation from them of a swollen polymer phase occurs on standing at 20° C., AVTUR 50 being a liquid hydrocarbon fuel complying with U.K. Government Specification D.Eng.RD 2494 (NATO Code No. F-35);

(B) A 0.3% by weight solution of the copolymer in AVTUR 50 aviation kerosene has a relative viscosity in the range 1.3 to 2.1 and a differential orifice flow rate in the range 3 to 6 ccs. per 30 seconds, the said relative viscosity being the ratio of (a) the viscosity of the 0.3% by weight copolymer solution in AVTUR 50 when measured by the method of British Standard No. 188:1937 "The Determination of the Viscosity of Liquids in C.G.S. Units", Part 2, using a U-tube viscometer, Size A, at 25° C., to (b) the viscosity of AVTUR 50 when measured under those same conditions, and the said differential orifice flow rate being the difference between (c) the flow rate of a 0.3% by weight solution of the copolymer in AVTUR 50 through a passage of circular cross-section having a square-edged orifice, the passage having a length of 0.062 inches and a diameter of 0.025 inches, and (d) the flow rate through the same said passage of a Newtonian liquid having the same viscosity as that of the copolymer solution referred to in (c) when the said viscosities are measured by the method of British Standard No. 188:1937, the flow rates being expressed as the volume of liquid in ccs. which passes through the orifice during the second period of 30 seconds of flow.

4,356,004

PROCESS FOR FORMING CHARGING FUEL INTO AGGLOMERATES FOR THE PRESSURE GASIFICATION OF COAL

Artur Richter, Langensiepenstrasse 25, D-4330 Mulheim, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 970,668, Dec. 18, 1978, abandoned. This application Jul. 7, 1980, Ser. No. 165,851

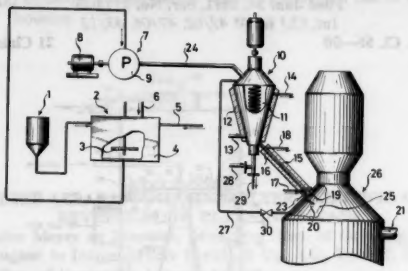
Claims priority, application Fed. Rep. of Germany, Jan. 24, 1978, 2802954

Int. Cl.³ C10J 3/00

U.S. Cl. 48—210 3 Claims

1. A process for forming charging fuel into agglomerates for the pressure gasification of coal, comprising the steps of: mixing fine, granular charging fuel of a particle size up to 30 millimeters, with a binder outside the pressure reactor, passing said mixture to a pump assembly, pumping said mixture through a first pipe, wherein the mixture forms a pressure-tight, heat-checking seal, and into a hollow worm heat exchanger, equalizing the pressure of the mixture when it is in the worm heat exchanger and the pressure prevailing in the reactor while cooling said mixture, feeding the mixture through a

second pipe, wherein the mixture forms a pressure tight seal, to the fixed bed of the reactor from above, and gasifying the coal in the reactor; said mixture being made with a binder which



hardens when heated and being kept below hardening temperature during subsequent subjection to pressure until fed to the reactor, the agglomerates being produced by hardening of the binder in the heat prevailing in the reactor above the fixed bed.

4,356,005

SEPARATION OF GASES

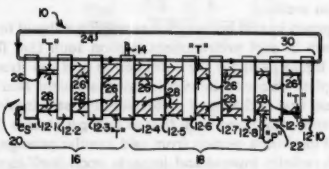
Werner A. Schumann, Pretoria, South Africa, assignor to Atomic Energy Board, Pretoria, South Africa

Filed Mar. 31, 1981, Ser. No. 249,553

Claims priority, application South Africa, Apr. 21, 1980, 80/2363

Int. Cl.³ B01D *59/20*

U.S. Cl. 55—17 **20 Claims**



1. In the operation of a cascade process for separating a process gas feed comprising several components into a product gas which is enriched relative to the process gas feed in respect of a desired component and a stripped gas which is depleted relative to the process gas feed in respect of the desired component, a carrier gas having a lower molecular weight than the process gas being circulated with the process gas along the cascade from the stripper end of the cascade to the product end of the cascade where it is separated from the process gas, and thence back to the stripper end of the cascade where it is reintroduced into the cascade, the process gas feed being introduced into the cascade at a position intermediate the stripper end and the product end, and the cascade comprising a plurality of modules each including one or more gas separation elements for separating a stream of process gas received from an external supply and/or from one or more other modules in the cascade into an enriched stream and a depleted stream which pass on to other modules in the cascade, the method whereby, for a plurality of the modules, the relative proportions of process gas leaving and entering each module are selected such that there is a substantially constant molar flow rate of gas in each direction along the cascade through said plurality of modules, the proportion of carrier gas relative to process gas increasing progressively in a direction from the feed to the product end of the cascade, and the proportion of carrier gas relative to process gas increasing progressively in a direction from the feed to the stripper end of the cascade, the mass flow rate of the gas decreasing progressively in a direction from the feed to the product end of the cascade, and in a direction from the feed to the stripper end of the cascade.

4,356,006

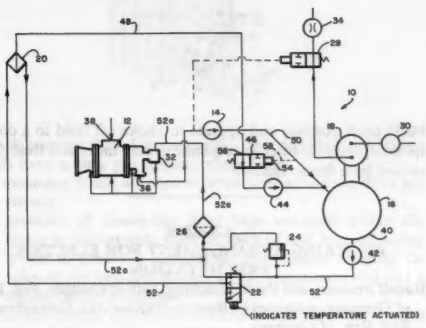
OIL SUPPLY SYSTEM, AND METHOD OF RETROFITTING, AND METHOD OF INHIBITING OIL FOAMING IN, AN OIL SUPPLY SYSTEM

Kenneth Y. Miller, Salisbury, and William R. Hutchinson, Winston-Salem, both of N.C., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Jun. 30, 1980, Ser. No. 164,609

Int. Cl.³ B01D *19/02;* **F04B** *49/02*

U.S. Cl. 55—55 **9 Claims**



8. A method of inhibiting oil foaming, in an oil supply system for an oil-using machine, such as a gas compressor, which machine discharges pressured gas and oil vapor, said system having first means comprising a separator which defines (1) an oil reservoir and (2) a chamber thereabove in which to confine pressured gas; second means comprising an oil supply line communicating at one end thereof with said reservoir for supplying oil from said reservoir to an oil-using and pressured gas and oil vapor discharging machine, via the other end of said supply line, and third means, comprising a conduit communicating at one end thereof with said chamber for conducting pressured gas and oil vapor, discharged from a machine such as aforesaid, to said chamber; said conduit having a second end, opposite said one end, defining means for receiving therein pressured gas and oil vapor from such an aforesaid machine; comprising the steps of:

prohibiting oil flow from said oil supply line to said reservoir;

providing a fluid by-pass conduit between an intermediate portion of said oil supply line and said chamber;

evacuating said chamber of superatmospheric-pressured gas; and

opening said conduit to fluid flow therethrough only when said chamber has been substantially evacuated of said pressured gas.

4,356,007

AUTOMATIC FILTER NETWORK PROTECTION, FAILURE DETECTION AND CORRECTION SYSTEM AND METHOD

Harold L. Bowman, Rte. #4, Box 1177, Pell City, Ala. 35125

Filed Jul. 10, 1979, Ser. No. 56,206

Int. Cl.³ B01D *46/00*

U.S. Cl. 55—213 **7 Claims**

1. An automatic filtering network protection, failure detection and correction system comprising a plurality of fabric cell type filters in said network and means processing a fluid flow path through the plurality of filters in parallel, including individual filter tube valves operable responsive to any increased fluid flow through the corresponding filter cell caused by a

hole in the fabric filter of that cell, wherein the valves are fitted to control flow of fluid through the individual cells in a normally open position and operate to choke off fluid to a corresponding tubular filter in response to said increased fluid flow caused by a fabric failure.

4,356,008

KNOCKING ARRANGEMENT FOR ELECTRIC PRECIPITATION

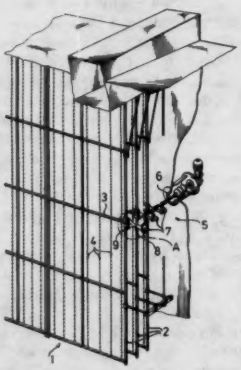
Rudolf Franzen, and Peter Klingberg, both of Cologne, Fed. Rep. of Germany, assignors to Buckau-Walther AG, Grevenbroich, Fed. Rep. of Germany

Filed Nov. 23, 1981, Ser. No. 323,910

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1980, 3044018

Int. Cl.³ B03C 3/76

U.S. Cl. 55—112 10 Claims



1. A knocking arrangement for cleaning electrodes arranged on frame members of a frame of an electric precipitator, comprising hammer means including a rotary hammer shaft and a plurality of hammer members mounted thereon; anvil means including a plurality of anvils arranged so that said hammer members strike against said anvil members; and means for connecting said anvil members with the frame members, said connecting means including a V-shaped holding member having a closed end portion arranged to embrace one frame member of the frame of the precipitator and an open end portion provided with two projections, and a wedge member carrying a respective one of said anvil members and also received into said holding member between said projections and the one frame member.

4,356,009

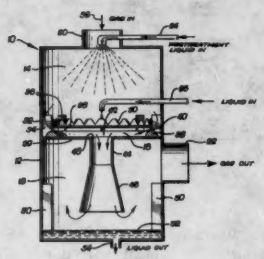
GAS SCRUBBER AND RELATED METHOD

Seymour Calvert, San Diego, Calif., assignor to Air Pollution Technology, Inc., San Diego, Calif.

Filed Jun. 24, 1981, Ser. No. 277,025

Int. Cl.³ B01D 47/02, 47/06, 47/12

U.S. Cl. 55—90 21 Claims



1. A scrubber device for removing finely divided contaminants from a gas stream, comprising:

a housing comprising a pretreatment section, an implosion section, and a diffusion section, all said sections in series flow communication with each other;

an inlet conduit joined to said housing for directing a gas stream into said pretreatment section;

a first plate disposed in said housing between said pretreatment section and said implosion section, wherein said first plate forms an annular flow passage for said gas stream from said pretreatment section into said implosion section and further wherein said first plate forms part of said implosion section;

means disposed in said housing for supplying a liquid to said gas stream in said pretreatment section such that finely divided liquid particles are entrained in said gas stream;

a second plate disposed in said housing adjacent said first plate, said first and second plates defining said implosion section and configured such that as said gas stream flows into said implosion section from said annular passage, it is directed radially inward and impacts upon itself in a defined area between said plates thereby encouraging said finely divided contaminants to be removed from said gas stream by intertial impaction;

said diffusion section constructed and arranged to received said gas stream from said implosion section and including means for removing said finely divided liquid particles; and

an outlet conduit joined to said housing for directing the now cleaned gas stream out of said diffusion section.

21. A method for removing finely divided contaminants from a gas stream comprising the steps of:

(a) providing a housing having a pretreatment chamber having gas inlet means, a diffusion chamber having gas outlet means and an implosion chamber disposed therebetween and in flow communication therewith, said housing further having a flat plate disposed in said housing defining an annular flow passage from said pretreatment chamber to said implosion chamber;

(b) directing a stream of gas containing contaminants through said pretreatment chamber such that it impinges on said plate;

(c) providing said stream of gas with finely divided liquid drops such that said drops are entrained therein;

(d) directing said gas stream and entrained liquid drops through said annular flow passage and then into said implosion chamber in a radially inward direction causing said gas stream and liquid drops to impact upon themselves whereby at least some of said contaminants are removed by inertial impaction and interception;

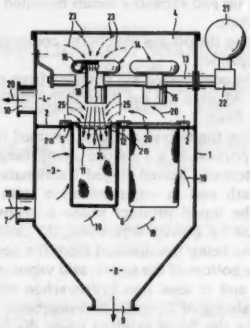
(e) directing said gas stream into said diffusion chamber where the velocity of the gas stream is decreased;
(f) removing additional liquid drops and contaminants from said gas stream; and
(g) directing a substantially cleaned gas stream out of said housing.

4,356,010

FILTER APPARATUS HAVING FILTER ELEMENTS AND REVERSE-FLOW CLEANING MEANS

Heinz Meyer zu Riemsloh, Marl, Fed. Rep. of Germany, assignor to Intensiv-Filter GmbH & Co. KG, Velbert, Fed. Rep. of Germany

Filed Jul. 7, 1980, Ser. No. 166,736
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1980, 3004453
Int. Cl.³ B01D *46/04*
U.S. Cl. 55—302 10 Claims



1. In a filter apparatus comprising a housing having a dust-laden gas inlet, a clean gas outlet, a dust-laden chamber, a purified gas chamber, and having therein a plurality of gas filter elements for cleaning gas flowing therethrough between the dust-laden gas chamber and the purified gas chamber and a cleaning device including reverse-flow means for purging the gas filter elements, the reverse-flow means, comprising a two-stage injector for the drawing in of secondary purified gas from the purified gas chamber in two stages, respectively, which is positioned and arranged with respect to each filter element for the cleaning of the latter by means of pulses of scavenging gas which are injected in counter-current into each filter element, the improvement in the reverse-flow means wherein

the two-stage injector for each said filter element comprises

a pair of injectors for said each filter element comprising,

a first stage injector comprising an annular slot nozzle and positioned and arranged in the purified gas chamber to inject therethrough the scavenging gas and draw therein the secondary purified gas, and

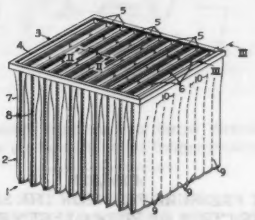
a second stage injector comprising an inlet nozzle positioned and arranged with respect to said annular slot nozzle and each said filter element so as to communicate substantially exclusively with said annular slot nozzle and with said each filter element to inject therethrough the scavenging gas and the secondary purified gas from said annular slot nozzle as well as to draw therein additional amounts of the secondary purified gas.

4,356,011

POCKET FILTER ASSEMBLY

Charles E. Day, Jeffersonville, Ind., and William A. Putman, Louisville, Ky., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed May 26, 1981, Ser. No. 267,024
Int. Cl.³ B01D *46/02*
U.S. Cl. 55—368 8 Claims



1. A gaseous fluid filter assembly for removing particulate solids from a dirty gas stream, comprising:

a mounting frame adapted to be secured across the dirty gas stream;

a plurality of sheath-like filter bags mounted within the frame in side-by-side relation, each of said bags including a pair of generally rectangular filter panels forming the sides of the bag and having an open upstream end and a closed downstream end;

first and second stay means interconnecting the filter panels of each bag in spaced relation, said first and second stay means extending generally parallel to one another along the length of each bag and being alternately disposed across substantially its width to shape each bag into a plurality of adjacent tube-like sections which are each of an essentially uniform cross-section throughout the length of each bag and open into one another upon inflation of each bag by the gas stream; and

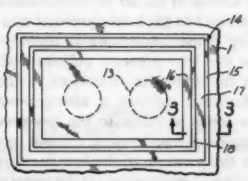
said first stay means being of a lesser length extending between the filter panels of each bag than said second stay means, so as to alternately vary the thickness of each bag when it is inflated at the junctures of said tube-like sections to minimize interference between the adjacent filter bags while maximizing the surface area of each of the filter panels available to filter the dirty gas stream along substantially the entire length of the bags.

4,356,012

MEDICAL LIQUID CONTAINER WITH FILTER VENT

Jack H. Hofstetter, Anaheim, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Continuation of Ser. No. 936,754, Aug. 25, 1978, abandoned.
This application Apr. 21, 1980, Ser. No. 142,194
Int. Cl.³ B01D *50/00*
U.S. Cl. 55—385 C 10 Claims



1. A medical liquid container having a thermoplastic wall with a filter which comprises a material different than the wall material and which covers a vent opening in the wall, wherein the improvement comprises: a direct face to face contact zone

between the filter and wall about the vent opening wherein the two different materials of the wall and filter are in contact with each other; and a liquid-tight seal in the contact zone that includes a plurality of permanently fused anchor areas separated by a relief area, which anchor areas are at a common interface between the two different materials of the wall and filter within the contact zone.

4,356,013

SPLIT PRESSURE FEED FOR THE SELECTIVE PRODUCTION OF PURE OXYGEN FROM AIR

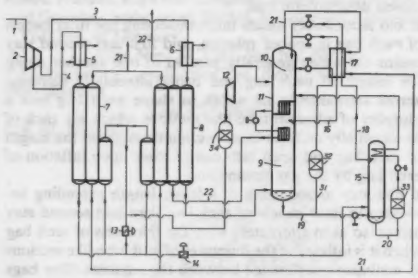
Gerhard Linde, and Guenter Rueckborn, both of Gruenwald, Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Jan. 28, 1980, Ser. No. 116,195

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1979, 2903089

Int. Cl.³ F25J *3/04*

U.S. Cl. 62—13 **19 Claims**



1. In a process for obtaining oxygen from air by low-temperature rectification in a double rectification column comprising a high-pressure column and a low-pressure column, said process comprising compressing the air to be fractionated into higher and lower pressure partial streams; cooling said partial streams in indirect heat exchange with a nitrogen-enriched gaseous stream from the rectification column; and introducing the partial stream of the air to be fractionated which has been compressed to the higher pressure into the lower part of the high pressure column,

the improvement which comprises passing at least a part of the partial stream of the air to be fractionated which has been compressed to the lower pressure to a supplemental fractionating column operating at between the pressure ambient in the high-pressure column and the pressure ambient in the low-pressure column, withdrawing from said supplemental column a nitrogen-enriched liquid, passing the latter as reflux to the low-pressure column, said supplemental fractionating column operating at 1–3 bars above the pressure of the low-pressure column, engine expanding at least one of (a) the remaining portion of the partial stream compressed to the lower pressure, and (b) a gaseous stream withdrawn from the supplemental fractionating column; and introducing resultant engine expanded fluid in a substantially gaseous phase into the low-pressure column.

4,356,014

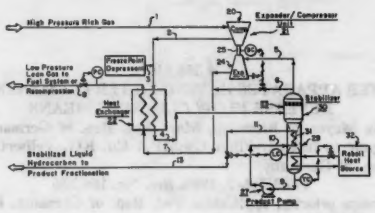
CRYOGENIC RECOVERY OF LIQUIDS FROM REFINERY OFF-GASES

Robert D. Higgins, Houston, Tex., assignor to Petrochem Consultants, Inc., Houston, Tex.

Division of Ser. No. 26,809, Apr. 4, 1979, Pat. No. 4,272,270. This application Apr. 17, 1981, Ser. No. 255,339

Int. Cl.³ F25J *3/02*

U.S. Cl. 62—28 **6 Claims**



1. A process for cryogenic recovery of liquid from refinery off-gas, comprising:

(a) feeding the off-gas to a compressor/expander having compressor means and expander means mounted and driven on a common shaft;

(b) compressing the off-gas feed in the compressor of the compressor/expander;

(c) cooling the compressed gas obtained from step (b) in a heat exchanger wherein the gas is partially condensed to form a two-phase fluid;

(d) transmitting the two-phase fluid obtained in step (c) to the separator portion of a stabilizer comprising said separator and an externally heated staged fractionation column situated beneath and in communication with the separator, wherein the liquid product phase is recovered from the vapor phase by gravity separation, the constituents of said vapor phase being fractionated from the net liquid product leaving the bottom of the tower, said vapor phase containing hydrogen and at least one hydrocarbon selected from the group consisting of C_1 to C_4 hydrocarbons;

(e) circulating the liquid product phase discharged from the bottom of the fractionation column of the stabilizer through a coil within the column whereby heat removed from the liquid product within the column furnishes supplemental side reboil heat for the stabilizer.

(f) transmitting the vapor phase separated in step (d) to the expander of the compressor/expander wherein the vapor is depressurized and cooled and partially condensed thereby, the enthalpy removed from the vapor by the expander supplying power to drive the compressor;

(g) transmitting the partially condensed depressurized vapor fraction obtained in step (f) to the heat exchanger for thermal contact with the compressed feed gas obtained in step (b) wherein the partially condensed depressurized vapor fraction is fully vaporized;

(h) withdrawing the fully vaporized fraction from the heat exchanger; and

(i) withdrawing the liquid product phase from the column.

4,356,015

DESALINIZATION PROCESS

Frank C. Oliver, 700 Delta Way, Watsonville, Calif. 95076

Filed Nov. 22, 1978, Ser. No. 962,965

Int. Cl.³ B01D *9/04*

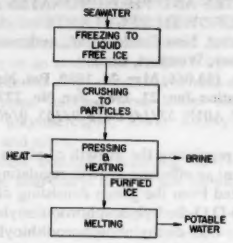
U.S. Cl. 62—543 **9 Claims**

1. A method for purifying salt water which comprises:

(a) freezing said salt water to a temperature sufficient to provide a liquid-free ice;

(b) crushing said liquid-free ice into ice particles having a mean diameter less than 1 cm;

(c) Compressing said crushed ice under a compressive force of about 5 to 1200 pounds per square inch and supplying external heat at a temperature from 80 to 150 degrees Centigrade for a period of tine sufficient to liquify at least 30 percent of said crushed ice, thereby forming a concentrated salt water solution and purified ice;



(d) removing said concentrated salt water solution from said purified ice; and

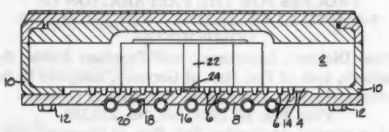
(e) recovering and melting said purified ice to recover purified water.

4,356,016

COOLING TUBE ALIGNMENT MEANS AND PROCESS THEREFOR

Eric J. Brosch, Grand Rapids, and William H. Sterrett, Toledo, both of Ohio, assignors to Manville Service Corporation, Denver, Colo.

Filed Jun. 18, 1981, Ser. No. 274,946
Int. Cl.³ C03B *37/025*
U.S. Cl. 65—1 **2 Claims**



1. In a fiberizing bushing wherein alignment members are secured to the framework of said bushing so that a space exists between the upper surface of each of said alignment members and the bottom of said bushing in which are located a plurality of rows of tips and wherein each of said alignment members has a plurality of notches in its bottom surface for receiving cooling tubes, the improvement comprising:

(a) filling only a small portion of said space with a refractory cement locating said refractory cement in the portion of said space above a central cooling tube and between two central rows of tips.

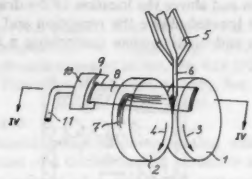
4,356,017

METHOD AND APPARATUS FOR CATCHING A PARTLY FIBRATED MINERAL BLOOM

Bill Ankersson, Skövde, Sweden, assignor to Rockwool Aktiebolaget, Sweden

Filed Feb. 18, 1981, Ser. No. 235,606
Claims priority, application Sweden, Feb. 22, 1980, 8001395
Int. Cl.³ C03B *37/05*
U.S. Cl. 65—8 **15 Claims**

1. Method of catching a partially fibrated mineral bloom which is thrown out from rotating fibrating wheels (1, 2) which are supplied with a mineral bloom (6), characterized in that the fibrated mineral is caught by means of jets or flows of a liquid medium, especially water, which is directed to the fibrous material at an angle to the out throw direction thereof from the fibrating wheel or wheels (1, 2) whereby the fibre



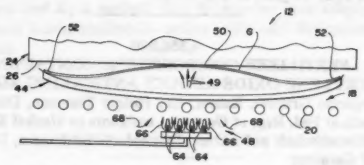
material is deflected from the out throw direction and is brought away by the liquid flow for further treatment.

4,356,018

METHOD AND APPARATUS FOR DEEP BENDING GLASS SHEETS

Harold A. McMaster, 707 Riverside Dr., Woodville, Ohio 43469

Filed Sep. 4, 1981, Ser. No. 299,412
Int. Cl.³ C03B *23/02*
U.S. Cl. 65—104 **14 Claims**



1. A method for deep bending glass sheets comprising: supporting a heated glass sheet against a downwardly facing surfce above a curved bending mold having an upwardly concave shape; supplying an upward gas flow at a central portion of the supported glass sheet between opposite extremities thereof; releasing said opposite extremities of the glass sheet so as to drop downwardly onto the mold while the upward gas flow continues to support the central portion of the glass sheet against the downwardly facing surface; and thereafter terminating the upward gas flow such that the central portion of the glass sheet drops downwardly and bends on the mold.

8. Apparatus for deep bending glass sheets comprising: a holding having a downwardly facing surface for supporting and releasing a heated glass sheet; a bending mold having an upwardly facing concave shape for receiving a heated glass sheet from the holder surface; a gas supply unit for supplying an upward gas flow against a central portion of the heated glass sheet supported against the holder surface to maintain said central portion supported as opposite extremities of the glass sheet drop downwardly onto the mold; and a control for terminating the upward gas flow from the gas supply unit to release the central portion of the glass sheet from the holder surface for bending on the mold.

4,356,019

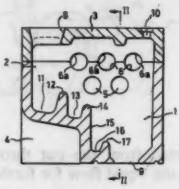
GLASS SPINNING VESSEL

Bernard Gleeson, 21, Clarence Grove Rd., Weston-super-Mare, Avon, England

Filed Nov. 18, 1980, Ser. No. 208,114
Claims priority, application United Kingdom, Nov. 23, 1979, 7940611; Nov. 23, 1979, 7940612
Int. Cl.³ C03B *5/16, 5/22*
U.S. Cl. 65—346 **9 Claims**

1. In a glass spinning vessel for receiving pre-manufactured

glass in solid form, remelting said glass and feeding the same from a main body of glass to a draw bar in the base of the vessel: the improvement comprising said vessel including a lateral extension defining a reception and melting zone laterally offset from and above the location of the draw bar, at least one glass inlet located above the reception and melting zone, said reception and melting zone comprising a first reception



trough for receiving glass to be melted from the inlet, a first weir, a second reception trough separated from the first reception trough by the first weir, and a second weir separating the second reception trough from the main body of glass in the vessel, whereby the freshly melted glass is constrained to follow a sinuous path over the first weir, through the second reception trough and over the second weir before joining the main body of glass in the vessel.

4,356,020

FERTILIZER COMPOSITIONS CONTAINING ALKYLENE OXIDE ADDUCT ANTICAKING AGENTS

Margarete Grünert, Kaarst, and Holger Tesmann, Düsseldorf, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

Filed Nov. 20, 1981, Ser. No. 323,439

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1980, 3045131

Int. Cl.³ C05G *3/00*

U.S. Cl. 71—27 **6 Claims**

1. A method of decreasing the caking during storage in a hygroscopic salt or fertilizer which normally cakes on storage, which comprises uniformly admixing with said hygroscopic salt or fertilizer an effective anticaking amount of an anticaking agent consisting of one or more compounds selected from the group consisting of adducts of from 6 to 15 mols of ethylene oxide and/or propylene oxide onto 1 mol of a β-hydroxyalkyl-diethanolamine of the formula

wherein R^1 is an alkyl of from 1 to 18 carbon atoms and R^2 is hydrogen or alkyl of from 1 to 16 carbon atoms, the sum of the carbon atoms in R^1 and R^2 being from 8 to 18.

3. A composition in particulate, free-flowing form consisting essentially of a hygroscopic fertilizer or salt component which normally cakes on storage having a uniformly distributed, effective surface content as anticaking agent of from about 0.005 to 0.2% by weight, based upon the weight of the hygroscopic fertilizer or salt component, of one or more compounds selected from the group consisting of adducts of from 6 to 15 mols of ethylene oxide and/or propylene oxide onto 1 mol of β-hydroxyalkyl-diethanolamine of the formula

wherein R^1 is an alkyl of from 1 to 18 carbon atoms and R^2 is hydrogen or alkyl of from 1 to 16 carbon atoms, the sum of the carbon atoms in R^1 and R^2 being from 8 to 18.

4,356,021

LIQUID FERTILIZER SOLUTION CONTAINING ZINC

Joseph R. Kenton, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 30, 1980, Ser. No. 221,681

Int. Cl.³ C05G *1/06*; C05C *9/00*

U.S. Cl. 71—30 **19 Claims**

1. A method for preparing a liquid fertilizer concentrate comprising mixing, in an aqueous medium in the substantial absence of free ammonia, zinc oxide and ammonium thiosulfate, the mole ratio of ammonium thiosulfate to zinc oxide being at least about 2:1.

4,356,022

S-ALKYL AND ALKENYL-THIOPHENYLACETAMIDO THIOPHOSPHATES AND PHOSPHONATES AS PLANT GROWTH REGULANTS

Llewellyn W. Fancher, New Castle, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 133,066, Mar. 24, 1980, Pat. No. 4,283,395. This application Jan. 21, 1981, Ser. No. 227,018

Int. Cl.³ A01N *57/14*; C07F *9/165, 9/40*

U.S. Cl. 71—87 **2 Claims**

1. A method of regulating the growth of plants comprising applying to the plant an effective growth regulating amount of a compound selected from the group consisting of:

o-ethylmercapto-O,O-diethylphosphorodithioylacetanilide;

m-ethylmercapto-O,O-diethylphosphorodithioylacetanilide;

p-ethylmercapto-ethyl-O-isobutylphosphonodithioylacetanilide; and

p-(n-butylmercapto)-ethyl-O-ethylphosphonodithioylacetanilide.

4,356,023

CERTAIN HERBICIDAL TETRAHYDROFURANS

George B. Payne, and Samuel B. Soloway, both of Modesto, Calif., assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 30, 1980, Ser. No. 164,209

Int. Cl.³ A01N *43/08*; C07D *307/12*

U.S. Cl. 71—88 **3 Claims**

1. 5-Ethyltetrahydro-α,α-dimethyl-5-((phenylmethoxy)methyl)-2-furanmethanol.

4,356,024

PROCESS FOR THE PREPARATION OF 1-AMINO-1,3,5-TRIAZINE-2,4(1H, 3H)-DIONE COMPOUNDS

Karlfried Dickore', Leverkusen, and Engelbert Kühle, Berg.-Gladbach, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

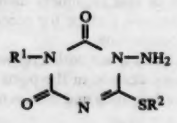
Filed Feb. 10, 1981, Ser. No. 233,250

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1980, 3006263

Int. Cl.³ C07D *251/38*; A01N *43/64*

U.S. Cl. 71—93 **13 Claims**

1. Process for the preparation of a 1-amino-1,3,5-triazine-2,4(1H, 3H) dione compound of the formula:



(I)

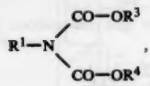
wherein:

R^1 represents a straight-chain or branched alkyl radical which has 1–10 carbon atoms and is optionally substituted by lower alkoxy, lower alkylmercapto, halogen, cyano or nitro; or an alkenyl radical with 3–8 carbon atoms, an alkynyl radical with 3–8 carbon atoms or a cycloaliphatic radical which has 5–8 ring carbon atoms, any of which is optionally substituted by lower alkyl or lower alkoxy; an araliphatic radical with 7–12 carbon atoms, the aromatic ring system of which being optionally substituted by halogen, nitro, trihalogeno-lower alkyl, cyano, lower alkyl, lower alkoxy or lower alkylmercapto; an aromatic radical which has 6–12 carbon atoms and is optionally substituted by halogen, nitro, trihalogeno-lower alkyl, cyano, lower alkyl, lower alkoxy or lower alkylmercapto; or a hetero-

cyclic radical with 5–6 ring atoms, optionally containing 1–3 hetero-atoms selected from oxygen and/or sulphur and/or nitrogen, in the ring system, and

R^2 represents a straight-chain or branched alkyl radical which has 1–6 carbon atoms and is optionally substituted by lower alkoxy, lower alkylmercapto, lower alkoxycarbonyl, halogen, cyano or nitro; an alkenyl radical with 3–6 carbon atoms; an alkynyl radical with 3–6 carbon atoms; a cycloaliphatic radical which has 5–8 ring carbon atoms and is optionally substituted by lower alkyl or lower alkoxy; or an araliphatic radical with 7–12 carbon atoms, the aromatic ring system of which optionally carrying substituents selected from lower alkyl, lower alkoxy, lower alkylmercapto, lower alkoxycarbonyl, halogen, cyano and nitro,

which process comprises reacting an N-substituted imidodicarboxylic acid diaryl ester of the formula:



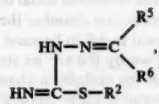
(II)

in which:

R^1 has the same meaning as above, and

R^3 and R^4, which may be identical or different, each represent a phenyl radical optionally carrying substituents selected from lower alkyl, lower alkoxy, halogen, halogeno-lower alkyl, cyano and nitro, or a naphthyl radical,

with an isothiosemicarbazone of the formula:



(III)

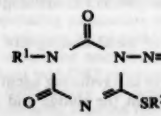
in which:

R^2 is identified as above,

R^5 represents hydrogen or alkyl with 1–3 carbon atoms, cycloalkyl with 5–7 carbon atoms, benzyl or an aryl radical with 6–10 carbon atoms each of these radicals being optionally substituted by halogen, cyano, nitro, lower alkyl, lower alkoxy or lower alkylmercapto, and

R^6 represents alkyl with 1–3 carbon atoms, cycloalkyl with 5–7 carbon atoms, benzyl or aryl with 6–10 carbon atoms each of these radicals being optionally substituted by halogen, cyano, nitro, lower alkyl, lower alkoxy or lower alkylmercapto, or

R^5 and R^6, together with the alkylidene carbon atom, represent a 5-membered to 7-membered carbocyclic ring, at a temperature between 50° and 150° C. and hydrolyzing, in acid medium, the 1-alkylideneamino-1,3,5-triazine-2,4(1H, 3H)-dione thereby formed of the formula:



(IV)

in which R^1, R^2, R^5 and R^6 are identified as above.

4,356,025

N-(BENZENESULFONYL) THIOCARBAMATES - HERBICIDAL ANTIDOTES

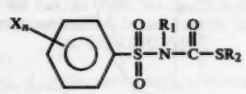
Edmund J. Gaughan, Berkeley, and Charles Kezerian, Orinda, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 108,890, Dec. 31, 1979, Pat. No. 4,297,295, which is a division of Ser. No. 723,251, Sep. 17, 1976, abandoned, which is a continuation-in-part of Ser. No. 619,115, Oct. 2, 1975, abandoned. This application Mar. 6, 1981, Ser. No. 241,278

Int. Cl.³ A01N *37/00*

U.S. Cl. 71—100 **42 Claims**

1. A herbicidal composition consisting essentially of an effective amount of a thiocarbamate herbicide and an antidotally effective amount of a compound corresponding to the formula



in which X is hydrogen, methyl, chloro, bromo, or methoxy; R_1 is hydrogen or methyl; and R_2 is alkyl having from 1 to 4 carbon atoms, inclusive, methylthio-p-chlorobenzene sulfonyl carbamate, benzyl or 4-chlorophenyl; provided that when X is hydrogen and R_1 is methyl, then R_2 is other than ethyl; said compound being antidotally active with said thiocarbamate herbicide.

4,356,026

SUBSTITUTED CYCLOPROPYLMETHOXY PHENYL UREAS AND THEIR USE AS HERBICIDES

Raymond A. Felix, Richmond, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

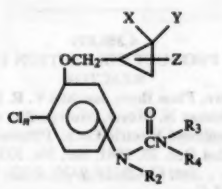
Continuation-in-part of Ser. No. 12,992, Feb. 21, 1979, abandoned, which is a division of Ser. No. 807,940, Jun. 21, 1977, Pat. No. 4,149,874. This application Jan. 23, 1980, Ser. No. 114,539

Int. Cl.³ A01N *47/30*; C07C *127/19, 83/10*

U.S. Cl. 71—120 **53 Claims**

53. An herbicidal composition of matter comprising:

(a) an herbicidal amount of a compound having the formula



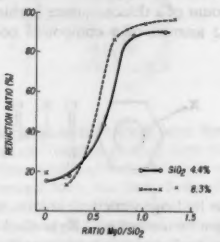
in which R_2 is hydrogen, lower alkoxyalkyl or lower alkanoyl; R_3 and R_4 are independently hydrogen, lower alkyl or lower alkoxy; X and Y are independently chloro, fluoro or bromo; Z is hydrogen, methyl, di-methyl or one methyl and one chloro substituent; and n is 0 or 1, and

(b) an inert diluent or carrier.

4,356,027
IRON ORE PELLETS CONTAINING MAGNESIUM OXIDE

Takeshi Sugiyama; Shoji Shirouchi, both of Kobe; Mamoru Onoda, Miki; Fumikazu Kawaguchi, and Isao Fujita, both of Kobe, all of Japan, assignors to Kobe Steel, Limited, Kobe, Japan

Filed Aug. 29, 1980, Ser. No. 182,599
Claims priority, application Japan, Sep. 3, 1979, 54-112648
Int. Cl.³ C22B 1/14
U.S. Cl. 75—0.5 R **4 Claims**



1. Iron ore pellets which are formed by admixing an iron ore containing 8.41% or less of SiO_2 with a sufficient amount of magnesia or MgO feeding source to provide a ratio of MgO to SiO_2 of at least about 0.5, such that the basicity, expressed as the ratio of calcium oxide to SiO_2, is less than the about 0.05.

4,356,028
IN SITU PHOSPHORUS ADDITION TO TANTALUM

Victor T. Bates, Kenosha, Wis., assignor to Fansteel Inc., North Chicago, Ill.

Filed Aug. 24, 1981, Ser. No. 295,250
Int. Cl.³ B22F 9/24
U.S. Cl. 75—0.5 AB **12 Claims**

1. In the process for making tantalum powder wherein (1) a tantalum-containing material is digested in hydrofluoric acid to dissolve tantalum values and other materials in a hydrofluoric acid solution, (2) tantalum is separated from other materials by extraction of said solution with an organic solvent in a liquid-liquid solvent extraction process and a tantalum-rich solution is recovered therefrom, (3) said tantalum-rich solution is treated to precipitate a tantalum salt, (4) said tantalum salt is reduced to metallic tantalum by an alkali metal, and (5) metallic tantalum is recovered from said reduction step in the form of a powder, the improvement wherein a phosphorus-containing material is added to at least one of said steps (3) and (4) in an amount of at least 5 parts of elemental phosphorus per million parts of elemental tantalum at the step of said addition and an amount to provide from about 2 to about 400 parts of elemental phosphorus per million parts of elemental tantalum in the final powder.

4,356,029
TITANIUM PRODUCT COLLECTION IN A PLASMA REACTOR

Michael G. Down, Plum Boro; Joachim V. R. Heberlein, Forest Hills, and Thomas N. Meyer, Murrysville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 23, 1981, Ser. No. 333,838
Int. Cl.³ B22F 9/20, 9/22
U.S. Cl. 75—0.5 B **10 Claims**

1. A process for reducing a metal from a chloride salt; comprising the steps of:

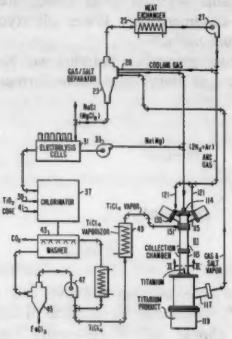
(a) striking an electric arc in an axial gap between the electrode of an arc heater;

(b) introducing a pressurized gas or gas mixture consisting of argon, helium and hydrogen through the gap and into the arc chamber to blow the electric arc from the gap and into the interior of the elongated arc chamber to form an elongated arc jet stream comprising the gas and projecting from the arc chamber into a reaction chamber;

(c) feeding into the arc jet stream a quantity of one element selected from the group consisting of an alkaline metal and an alkaline earth metal;

(d) feeding into the arc jet stream a quantity of a chloride of a metal;

(e) maintaining a temperature of the reaction chamber walls higher than the vapor point of the alkali metal chloride or alkaline earth metal chloride and lower than the melting point of the elemental metal;



(f) projecting the reaction products into a collection chamber to cause the elemental metal to separate from the gaseous salt and deposit on the interior wall of the collection chamber as a solid; and

(g) feeding the arc jet stream past the elemental metal deposited on the interior wall of the collection chamber thereby permitting the deposited elemental metal to become molten and subsequent to being blown by the arc jet stream, rapidly cooled in lower parts of the collection chamber, which are cooler than the uppermost parts thereby permitting the metal to be blown or fall gravitationally into an associated receptacle in the form of solidified globules, crystals, granules and large diameter powders.

4,356,030
SAFE DISPOSAL OF METAL VALUES IN SLAG

Peter T. Halpin, McLean, and George L. Zarur, Springfield, both of Va., assignors to World Resources Company, McLean, Va.

Filed Mar. 3, 1981, Ser. No. 240,057
Int. Cl.³ C22B 9/00
U.S. Cl. 75—21 **10 Claims**

1. The method of safely disposing of sludge containing metal values capable of having toxic ecological properties, including the steps of,

(a) mixing a charge of metal bearing ore with a reducing agent, and roasting it to drive off some of the sulfur components;

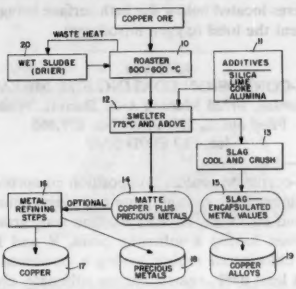
(b) drying a quantity of sludge using heat from the roasting step to produce an intermediate product containing said metal values;

(c) smelting the roasted charge of metal bearing ore in a furnace;

(d) mixing with the smelting charge as a reducing agent said intermediate product derived from the sludge and containing said metal values;

(e) maintaining the smelting temperature of the mixture above 775° C.;

(f) separating the mixture into a matte containing said metal and a slag containing said metal values; and



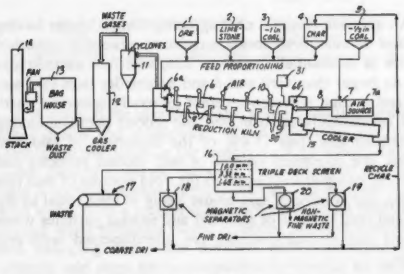
(g) cooling the slag with said metal values encapsulated therein.

4,356,031

APPARATUS AND METHOD FOR CONTROLLING THE RECYCLE CHAR CIRCUIT IN A DIRECT REDUCTION PROCESS

Harry W. Hockin, deceased, late of Attadale, Australia (by Jane S. Hockin, executrix); Brian F. Bracanin, Busselton, Australia; Ronald J. Clements, Capel, Australia; Vitie P. Keran, Bunbury, Australia, and Alan C. Baker, Harriman, Tenn., assignors to The Direct Reduction Corporation, New York, N.Y.

Filed Mar. 16, 1981, Ser. No. 244,154
Int. Cl.³ C21B *13/08*
U.S. Cl. 75—36 **10 Claims**



1. A method for controlling the process for the direct reduction of ore or other materials containing iron oxides using a solid carbonaceous reducing agent and oxygen-containing gas in a rotary kiln wherein part of the reducing agent is added from the discharge end of the kiln and the remainder of the reducing agent is added at the feed end, and the discharge materials include DRI, charred reducing agent suitable for reuse in said process, and fine waste, comprising the steps of:

(a) estimating, for the particular reducing agent, iron oxides and operating temperatures to be used in said process, the appropriate percentage of fixed carbon by weight to be contained in all the materials to be discharged from the discharge end of the kiln, and starting up the process using operating parameters in accordance therewith;

(b) weighing all of said kiln discharge materials;

(c) separating said charred reducing agent and fine waste from said DRI produced and from each other;

(d) determining the weight of fixed carbon in said DRI produced, charred reducing agent, and fine waste;

(e) determining the percentage of the fixed carbon by weight in the total discharge materials from the discharge end of the kiln to determine whether it is in the range of said estimated appropriate percentage;

(f) adjusting the process operating parameters to establish an actual percentage corresponding to optimum process operation;

(g) transporting said separated charred reducing agent to a bin from which it is fed at a preselected rate back to the kiln;

(h) establishing a level of charred reducing agent in said bin at which optimum process operation is achieved; and

(i) maintaining said charred reducing agent at said level in said bin to maintain the process at optimum operation.

4,356,032

METHOD OF DEPHOSPHORIZING MOLTEN PIG IRON

Hitoshi Morishita; Hajime Bada, and Fumio Sudo, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Jun. 23, 1981, Ser. No. 276,508
Claims priority, application Japan, Jun. 28, 1980, 55-88081
Int. Cl.³ C21C *7/02*
U.S. Cl. 75—52 **10 Claims**

1. A method of preliminarily dephosphorizing molten pig iron, wherein said molten pig iron is charged into a refining vessel provided at its bottom with tuyeres for blowing gas and at its top with a gas injecting member, and a powdery refining agent, consisting of a calcium oxide compound and acting to produce a dephosphorization reaction, together with said blowing gas is blown into said molten pig iron through said tuyeres, while a flux, adding together with said refining agent to said molten pig iron for reducing the viscosity and melting point of the resulting slag, is charged into said refining vessel to perform desiliconization and subsequent dephosphorization of said molten pig iron, which method comprises:

(a) charging a coolant together with said molten pig iron into said refining vessel to control the temperature of said molten pig iron during the blowing in a range of 1,250°–1,450° C.;

(b) blowing said powdery refining agent into said molten pig iron so as to adjust a value of slag basicity after the treatment to not less than 2.5; and

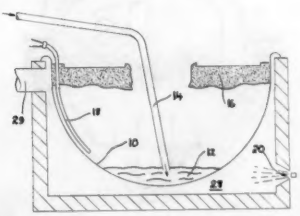
(c) blowing said blowing gas at a rate of not less than 0.5 Nm^3/min per ton of molten pig iron so that a net oxygen quantity is 8–15 Nm^3 per ton of molten pig iron.

4,356,033

PROCESS FOR REFINING METALS BY DROSSING PROCEDURES

Thomas R. A. Davey, 5 Rhodes Dr., Glen Waverley, Victoria, Australia

Filed Jun. 10, 1980, Ser. No. 158,131
Int. Cl.³ C22B *13/06, 25/08*
U.S. Cl. 75—63 **14 Claims**

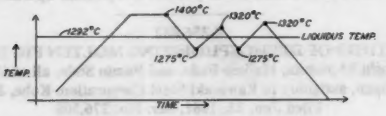


1. A process of removing an impurity from a bath of molten metal as a dross or crust, comprising cooling the surface of a body of a metal in a kettle by applying to said surface a cooling liquid and, simultaneously with said cooling, stirring the molten metal thereby to precipitate said impurity to form a solid crust in the form of a substantially unitary mass containing impurity precipitated by said cooling, said cooling liquid being applied to said surface such that an opening is present in said solid crust to permit insertion or withdrawal of a stirrer or pump into the molten metal below said solid crust.

4,356,034
METHOD OF REDUCING DEFECTS IN POWDER METALLURGY TUNGSTEN CARBIDE ELEMENTS

Robert P. Badrak, Missouri City, Tex., assignor to Reed Rock Bit Company, Houston, Tex.

Filed Sep. 10, 1980, Ser. No. 185,692
Int. Cl.³ B22F 3/12
U.S. Cl. 75—203 **3 Claims**



1. A method of manufacturing a cemented carbide insert for use in a drill bit for underground drilling and substantially reducing the voids therein without HIPing, said method consisting of the steps of:

mixing the desirable amount of binder or matrix metal and carbide fractions of powdered metal into a substantially homogeneous mixture;

shaping the desired amount of said mixture to obtain the desired finished shape, size and density of insert,

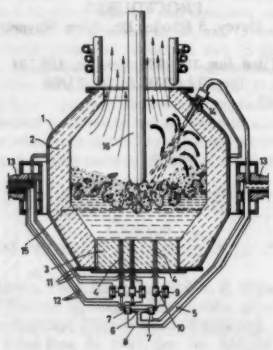
sintering the shaped insert at a temperature and time sufficient to densify the homogeneous powder mixture;

lowering and raising the temperature of the sintered insert across the solidus temperature line of said insert at least one time, and then cooling the insert to room temperature.

4,356,035
STEELMAKING PROCESS

Karl Brotzmann, and Paul Mantey, both of Sulzbach-Rosenberg, Fed. Rep. of Germany, assignors to Eisenwerk-Gesellschaft Maximilianshütte, Sulzbach-Rosenberg, Fed. Rep. of Germany

Filed Dec. 10, 1980, Ser. No. 214,844
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1979, 2951156; Mar. 4, 1980, 3008145
Int. Cl.³ C21C 5/32, 5/34
U.S. Cl. 75—52 **11 Claims**



1. A process for making steel in a convertor equipped with tuyeres located below the bath surface and with a water-cooled lance and with topblowing tuyeres located above the bath surface which comprises:

introducing the oxygen feed onto the bath surface through said water-cooled lance and by at least one topblowing tuyere pointing at the bath surface, and at least intermittently introducing an oxygen-free gas, loaded at least in part with ground solids for the purpose of slag formation or for the purpose of heat supply or for both purposes, into the melt through the tuyeres located below the bath surface, the amount of oxygen which is introduced through the tuyeres located below the bath surface being less than 10 percent the total oxygen introduced.

4,356,036
ANTI-CORROSION COATING FOR METALS

Nicolas Kaliardos, 10725 Morang Ave., Detroit, Mich. 48224

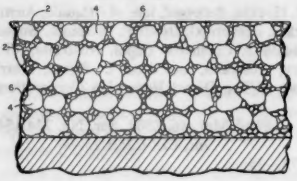
Filed Jul. 2, 1981, Ser. No. 279,865
Int. Cl.³ C09D 5/10
U.S. Cl. 106—1.12 **7 Claims**

1. An anti-corrosion coating composition comprising a mixture of aluminum paste or zinc paste containing aluminum or zinc flakes and a solvent, microcrystalline wax, aromatic hydrocarbon resin having a softening point, R and B, of 70° C.–140° C., chlorinated rubber having a combined chlorine content of at least 66%, neutral barium sulfonate, chlorinated solvent, aromatic hydrocarbon solvent and mineral spirits.

4,356,037
ABRASION RESISTANT COATING

Robert L. Novak, 7 Oxbow Rd., Medfield, Mass. 02052

Filed May 12, 1980, Ser. No. 149,138
Int. Cl.³ C08L 5/00; B32B 5/16
U.S. Cl. 106—209 **3 Claims**



1. An abrasion resistant coating comprising a binder having dispersed therein first abrasion-resistant generally spherical particles of substantially uniform size, said first particle size being no larger than Grit size 8 and no smaller than Grit size 1000, and second abrasion-resistant generally spherical particles of substantially uniform size, the second particles having diameters of less than 15.4% of the diameters of said first particles, the combined volume of said second particles and said binder being at least equal to the void volume of said first particles, the volume of said binder being at least equal to the combined void volume of said first and second particles when said first and second particles are interdispersed with one another.

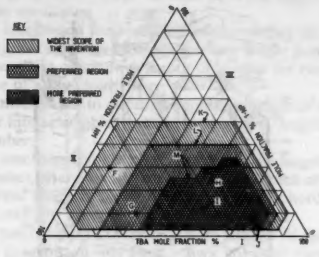
4,356,038
STABILIZATION OF CHLORINATED ALIPHATIC HYDROCARBONS AND USE OF STABILIZED COMPOSITION IN CLEANING ARTICLES

David Bain, Sutton Leach; John E. Martin, Grappenhall; John H. Saul, Upton-by-Chester, and Neil Winterton, Tarvin, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jul. 16, 1980, Ser. No. 170,835
Claims priority, application United Kingdom, Jul. 25, 1979, 7925867; Apr. 25, 1980, 8013705
Int. Cl.³ C11D 7/50; C23G 5/02; C09K 15/16; C07C 17/42
U.S. Cl. 134—2 **13 Claims**

3. A solvent composition comprising 1,1,1-trichloroethane having a stabilising amount of a mixture of stabilising components dissolved therein, characterized in that the mixture of stabilizing components comprises (i) tertiary butanol, (ii) nitromethane and (iii) 1- or 2-nitropropane or nitroethane in which the mole fractions percent of the stabilizing components are within the ranges encompassed by Contour K in FIG. 1 of the accompanying drawings or by Contour A in FIG. 2 of the accompanying drawings.

13. A method of cleaning metal and other articles which comprises contacting the articles with a solvent composition or



the vapour thereof, characterised in that the solvent composition is as claimed in claim 3.

4,356,039

METHOD FOR CLEANING DRAINS AND WATERWAYS

Jack R. Clifford, Alton, Ill., assignor to Paul L. Pratt and John T. Pierce, Jr., a part interest to each

Continuation-in-part of Ser. No. 42,548, May 25, 1979, Pat. No. 4,218,803, and a continuation-in-part of Ser. No. 26,806, Apr. 3, 1979, Pat. No. 4,216,561. This application Mar. 18, 1980, Ser. No. 131,420

The portion of the term of this patent subsequent to Aug. 28, 1996, has been disclaimed.

Int. Cl.³ B08B *9/02*

U.S. Cl. 134—8 **6 Claims**

1. A method for cleaning storm sewers, sanitary sewers and other drains and waterways which comprises the steps of prewetting the debris in the waterway with water from a first water directing means, plowing the prewetted debris loose with a plowing means, further wetting the prewetted debris with water from a second water directing means, said first and second water directing means directing water simultaneously, and sweeping the debris forward with a plunging means, wherein said steps are accomplished by towing an implement comprising an elongated carriage assembly with plowing means at its forward end and plunging means at its rearward end in spaced relationship with said plowing means, said first water directing means spraying water in advance of said plowing means and said second water directing means spraying water behind the plowing means but in advance of the plunging means.

4,356,040

SEMICONDUCTOR DEVICE HAVING IMPROVED INTERLEVEL CONDUCTOR INSULATION

Horng-Sen Fu, Sunnyvale, Calif.; Al F. Tasch, Jr., Richardson, and Pallab K. Chatterjee, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 2, 1980, Ser. No. 146,938

Int. Cl.³ H01L *21/70, 21/26*

U.S. Cl. 148—1.5 **7 Claims**

7. A method for manufacturing a semiconductor device comprising the steps of:

forming a first relatively thin insulating layer on the surface of a semiconductor substrate;

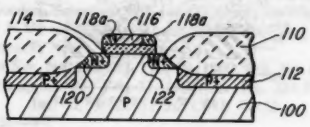
forming a conductive layer upon said first insulating layer;

forming a second relatively thick insulating layer to overlie said conductive layer;

patterning said second insulating layer and said first conductive layer to define a first gate electrode which is separated from said substrate by said first relatively thin insulating layer, the top surface of said first gate electrode being covered by said second insulating layer;

forming a third conformant insulating layer to overlie said gate electrode and the portion of said second insulating layer remaining on its top surface;

anisotropically removing said third insulating layer except from the side walls of said gate electrode and its overlying insulating layer;



removing said first insulating layer from all portions of said substrate except that portion covered by said first gate electrode and said relatively thick insulating region formed on the side wall thereof;

forming a second relatively thin insulating film on said substrate;

forming a second conductive layer to overlie said second insulating layer and at least a portion of said first gate electrode, said first gate electrode and the second conductive layer being laterally separated by said relatively thick insulating layer remaining of the side wall of said first gate electrode.

4,356,041

METHOD OF FABRICATING A MIS-TYPE DEVICE BY USING A GATE ELECTRODE AND SELECTIVELY IMPLANTED NITRIDE LAYER

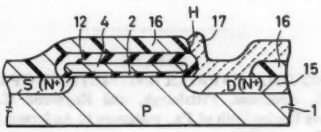
Yasunobu Kosa, Kodaira, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 1, 1980, Ser. No. 174,434

Claims priority, application Japan, Oct. 1, 1979, 54-125411

Int. Cl.³ H01L *21/22, 21/265*

U.S. Cl. 148—1.5 **16 Claims**



1. A method of fabricating a MIS-type device comprising the steps of:

forming selectively a conductor layer for a control electrode of the MIS-type device on an insulating layer formed on a major surface of a semiconductor substrate;

converting the surface of said semiconductor substrate, which is not covered with said conductor layer, into an oxygen impermeable layer; and

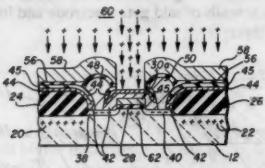
oxidizing thereafter the surface of said conductor layer by using said oxygen impermeable layer as a mask to form an oxidation film on said conductor layer.

4,356,042

METHOD FOR FABRICATING A SEMICONDUCTOR READ ONLY MEMORY

Jerrell M. Gedaly, Dallas; Joseph P. Sadowski; David D. Kirkland, both of Coppell, and Frank J. Sigmund, Dallas, all of Tex., assignors to Mostek Corporation, Carrollton, Tex.

PCT No. PCT/US80/01494, § 371 Date Nov. 7, 1980, § 102(e) Date Nov. 7, 1980
PCT Filed Nov. 7, 1980, Ser. No. 265,986
Int. Cl.³ H01L 21/265; B01J 17/00
U.S. Cl. 148—1.5 4 Claims



1. A method for producing a ROM semiconductor device having a selected bit pattern implanted therein, comprising the steps of:

(a) fabricating a plurality of memory cells on a semiconductor substrate wherein the memory cells are separated by field oxide, each cell having doped source and drain regions in the substrate on each side of a non-implanted channel region, a gate oxide immediately above the channel region, a polysilicon gate immediately above the gate oxide, a first oxide layer above the polysilicon gate, a nitride layer above the oxide layer, a second oxide layer above the nitride layer and metal contacts extending through the first and second oxide layers and the nitride layer for contact with the respective source and drain regions;

(b) depositing a third oxide layer to cover the surface of said device;

(c) etching the second and third oxide layers to expose the nitride layer above the channel regions of selected ones of said memory cells in accordance with said selected bit patterns;

(d) after etching said second oxide layer, exposing the device to a stream of ions having sufficient energy to penetrate the exposed nitride layer, the first oxide layer, the polysilicon gate and underlying gate oxide to implant the corresponding channel regions of each of the selected memory cells thereby changing the voltage thresholds of the selected memory cells, the ions having insufficient energy to effectively penetrate to the regions of said substrate not below the etched regions of said second oxide layer; and

(e) covering the surface of said device with a passivation layer after implanting the channel regions of the selected memory cells.

4,356,043

CUTTING TOOL CARRIER AND METHOD OF CUTTING

Harry E. Anderson, Pittsburgh, and Raymond E. Heasley, McKees Rocks, both of Pa., assignors to Anderson Engineers, Inc., Carnegie, Pa.

Filed Aug. 28, 1981, Ser. No. 297,401
Int. Cl.³ B23K 7/10
U.S. Cl. 148—9 R 33 Claims

1. A carrier for cutting tools which require utilities to operate, said carrier comprising,

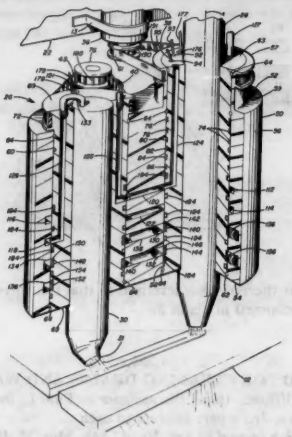
(a) a body,

(b) a plurality of tool holders pivotally mounted within the body and each adapted to receive a cutting tool,

(c) first pivot means enabling the body to be rotated about the axis of a first tool holder,

(d) second pivot means for rotating each of the remaining tool holders within the body,

(e) control means for transmitting control signals for the second pivot means through the first tool holder, said control means operative continuously regardless of any motion between the first tool holder and the body, and



(f) utility means for transmitting tool utilities first through the first tool holder, then through the body, and then through each of the remaining tool holders, said utility means operative continuously regardless of any motion between the tool holders and the body.

4,356,044

EMULSION EXPLOSIVES CONTAINING HIGH CONCENTRATIONS OF CALCIUM NITRATE

Harvey A. Jessop, Lehi, and Albert G. Funk, Salt Lake City, both of Utah, assignors to IRECO Chemicals, Salt Lake City, Utah

Filed Mar. 23, 1981, Ser. No. 246,763
Int. Cl.³ C06B 45/00
U.S. Cl. 149—2 10 Claims

1. A water-in-oil emulsion blasting agent comprising a water-immiscible liquid organic fuel as a continuous phase; an emulsified aqueous inorganic oxidizer salt solution as a discontinuous phase, which salt solution contais calcium nitrate in the amount of from about 50% to about 70% by weight based on the total composition and has a calcium nitrate to ammonium nitrate weight ratio of 1.5 or greater; an emulsifier; and optionally a density reducing agent.

4,356,045

COMPLETE PRODUCTION LINE OF WOOD I-JOIST MANUFACTURING APPARATUS THE METHOD OF MANUFACTURE, AND THE I-JOIST PRODUCT, HAVING LUMBER CHORDS AND A PLYWOOD WEB

William J. Elford, Auburn; Donald E. Williams, and Keith H. Miller, both of Tacoma, all of Wash., assignors to St. Regis Paper Company, Tacoma, Wash.

Filed May 30, 1980, Ser. No. 154,916
Int. Cl.³ B27D 1/10; B32B 31/18
U.S. Cl. 156—64 18 Claims

1. A complete production line of a wood I-joist manufacturing apparatus using lumber from random length supplies for the chords and plywood from random length supplies for the web, to make I-joists of many specified lengths and depths, inclusive of their immediate glue joint curing and strength testing, comprising:

(a) a mechanism for grouping selected near alike random lengths of lumber of like cross-section, inclusive of a stop to abut one end of each, a saw to trim these abutted ends,

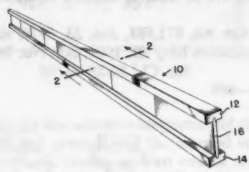
a finger cutter to form these trim edges, a glue applicator to glue these formed ends, a pivotal support to swing the group of random lengths to prepare the opposite ends using again, the stop, the trim saw, the finger cutter and glue applicator;

(b) a mechanism for receiving and crowding the now alike lengths of lumber to complete their finger joining into an essentially continuous length of lumber for chords, inclusive of a glue joint curer;

(c) a mechanism to cut the continuous length of chord lumber into selectable, then being specified, lengths of chord lumber;

(d) a mechanism for cutting grooves in the lengths of chord lumber, alternatively forming grooves, each of which is a mirror image of the other, one length of chord lumber so grooved to become the bottom chord;

(e) a mechanism to receive random lengths of like thickness of pregrouped plywood, saws to trim these random



lengths to a specified width, saws to cut inwardly of each trimmed width edge along one surface of the plywood, saws to cut inwardly of each trimmed width edge along the other surface of the plywood, and a crowder to create an endless web of these formed plywood pieces;

(f) a mechanism having conveyors for both the grooved chord lumber and the endless web plywood to converge the chord lumber into contact with web plywood, glue applicators to spread glue in the grooves and on the formed edges of the web plywood, just prior to their contact, and glue joint curers;

(g) a mechanism for continuing the conveying of the joined chord lumber and endless web, inclusive of a sensor, trigger, and actuator to locate a slight space between chord lengths, a traveling cut off saw moved across the web by the actuator to cut the web to match the chord lengths, thereby creating the I-joists; and

(h) a mechanism to immediately test the overall strength of each I-joist.

4,356,046

METHOD FOR THE MANUFACTURE OF A BATTERY SEPARATOR USING TUBING

Hiroaki Yamazaki, Sowa, and Takao Hasegawa, Kuki, both of Japan, assignors to Firma Carl Freudenberg, Weinheim an der Bergstrasse, Fed. Rep. of Germany

Filed Sep. 17, 1980, Ser. No. 187,998
Claims priority, application Japan, Sep. 17, 1979, 54-119622
Int. Cl.³ B29C *27/12;* B32B *31/26*
U.S. Cl. 156—86 **4 Claims**

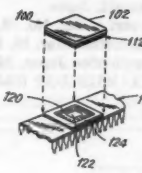
1. A method for the manufacture of a tubular battery separator with a closed end, comprising: forming a tubular body from a sheet of a separator material with a preponderant content of stretched thermoplastic fibers, such that in forming said tubular body overlapping edges of said sheet occur; welding the overlapping edges which occur together; inserting a disc fitted to the inside diameter from one end into said tubular body to a position near the other end leaving an overhanging edge; softening the overhanging edge by heating, causing it to shrink; and pressing said softened and shrunk edge against the disc so as to join the disc to the tubular body.

4,356,047

METHOD OF MAKING CERAMIC LID ASSEMBLY FOR HERMETIC SEALING OF A SEMICONDUCTOR CHIP

Richard Gordon, Scarsdale, and John G. Ciallella, White Plains, both of N.Y., assignors to Consolidated Refining Co., Inc., Mamaroneck, N.Y.

Division of Ser. No. 122,527, Feb. 19, 1980, Pat. No. 4,291,815. This application Feb. 17, 1981, Ser. No. 235,094
Int. Cl.³ B32B *31/26;* C04B *39/12*
U.S. Cl. 156—89 **4 Claims**



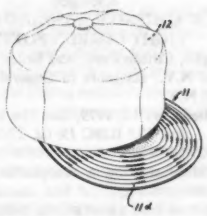
1. A method of fabricating a lid assembly for hermetic sealing of a package containing a semiconductor chip comprising the steps of depositing a metallized layer on the surface of said lid at the periphery thereof, depositing a printed heat fusible solderable layer over said metallized layer at the periphery of said lid, and preflowing said integral heat fusible solderable layer thereto.

4,356,048

CAP VISOR AND METHOD OF MANUFACTURE

James E. Price, New Albany, Ind., assignor to Adver-Togs, Inc., New Albany, Ind.

Continuation of Ser. No. 80,206, Oct. 1, 1979, abandoned, which is a division of Ser. No. 823,208, Dec. 5, 1977, Pat. No. 4,249,269. This application Mar. 9, 1981, Ser. No. 242,154
Int. Cl.³ B29C *27/04;* B32B *31/20, 31/22*
U.S. Cl. 156—220 **1 Claim**



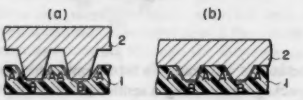
1. The method of producing a cap having a watertight visor which comprises the steps of cutting a first vinyl plastic outer cap visor member, an insert board and a second vinyl plastic outer cap visor member into preselected dimensions, assembling said first vinyl plastic outer cap visor member, said insert board and said second vinyl plastic outer cap visor member so that said insert board is sandwiched between all of the edge

margins of said first vinyl plastic outer cap visor member and said second vinyl plastic outer cap visor member, heat sealing said edge margins of said first vinyl plastic outer cap visor member and said second vinyl plastic outer cap visor member so that said insert board is encapsulated therewithin around all edges in a fully sealed and watertight relationship, thereafter placing said heat sealed assembled first vinyl plastic outer cap visor member, said insert board and said second vinyl plastic outer cap visor member within a patterned mold, transmitting high frequency radio waves through said patterned mold to cause flow of said first vinyl plastic outer cap visor member into the pattern of said mold and to maintain all of said edges margins in said fully sealed and watertight relationship, and securing said heat sealed assembled first vinyl plastic outer cap visor member, said insert board and said second vinyl plastic outer cap visor member onto the cap.

4,356,049
METHOD OF MANUFACTURING AN ELECTRET DEVICE

Sakae Tamura, Yokohama; Hiromi Yoshida, Akatsuka Shinmachi; Takehiko Kotoh, Sagamihara, and Masami Kobayashi, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation-in-part of Ser. No. 78,838, Sep. 25, 1979, abandoned. This application Mar. 10, 1981, Ser. No. 242,166
Claims priority, application Japan, May 25, 1979, 54-64007
Int. Cl.³ B32B *3/30*; H04R *19/00*
U.S. Cl. 156—220 **6 Claims**



1. A method of manufacturing an electret device, which comprises the steps of:

laminating a conductive member with a dielectric polymer film; and later causing a pressure deformation jig whose surface is provided with plural projections defining numerous minute convex and concave regions to abut against the surface of said dielectric polymer film with a pressure of 100 to 750 kg/cm^2 to thereby plastically deform the dielectric film in forming minute stretched and compressed concave and convex regions, said projections having walls inclined at an angle a, wherein $95° < a < 120°$; and

removing said jig from the surface of the dielectric film.

4,356,050
METHOD OF ADHESIVE BONDING USING VISIBLE LIGHT CURED EPOXIES

James V. Crivello, Clifton Park, and Bruce A. Ashby, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 11, 1979, Ser. No. 102,337
Int. Cl.³ B29C *19/02, 27/30*
U.S. Cl. 156—273.3 **15 Claims**

1. A method of making a composite adhesively-bonded article which comprises:

(1) applying to at least a part of one substrate a visible light-polymerizable composition consisting essentially of:

(i) an epoxidic prepolymer;

(ii) an effective amount of a catalyst precursor therefor comprising an aromatic iodonium salt of a complex halogenide; and

(iii) a small but effective amount of a catalyst activator comprising a dye;

(2) exposing said composition to a low intensity source of visible light for not substantially longer than required to initiate polymerization therein and discontinuing exposure to said source of light;

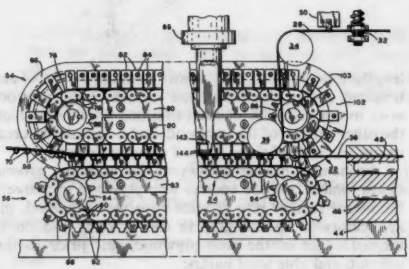
(3) simultaneously with discontinuing exposure or thereafter bringing the exposed surface of the composition-coated substrate into close contact with at least a part of the same or a different substrate to produce a temporary adhesive bond therebetween; and

(4) allowing sufficient time in the dark to elapse for the composition to substantially completely self-polymerize and produce a permanent adhesive bond.

4,356,051
APPARATUS FOR MAKING CONNECTION INSULATORS

Eldon E. Moodie, and Richard D. Burns, both of Holland, Mich., assignors to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 871,681, Jan. 23, 1978, abandoned. This application May 29, 1981, Ser. No. 268,529
Int. Cl.³ B32B *31/08*
U.S. Cl. 156—459 **6 Claims**



1. An apparatus for fabricating a connection insulator having a base portion established by a piece of a first strip of electrical insulating material and a retaining portion established by a piece of a second strip of electrical insulating material deformed in a predetermined pattern for establishing a plurality of insulating pockets, said apparatus comprising: a first track assembly movable along a longitudinally extending path and having a plurality of arbors movable laterally and transversely relative to such path, said arbors having a laterally retracted position and a laterally extended position; a second track assembly having a plurality of anvils movable along the aforementioned path; means for moving the plurality of arbors laterally and transversely relative to the path; means for moving the first and second track assemblies with the plurality of arbors of the first track assembly moving across a first strip of electrical insulating material moving along the aforementioned path and into the path of a second strip of electrical insulating material; means for extending the plurality of arbors before they reach the path of the second strip of electrical insulating material; said plurality of arbors of the first track assembly being operative to intermesh with corresponding anvils of the second track assembly while the arbors are in the extended position for deforming the second strip of insulating material and thereby establishing pockets between the two strips of electrical insulating material; securing means comprising an ultrasonic welding device for securing together the first strip of insulating material and the second strip of insulating material with ultrasonic welds; and means for severing the first strip of insulating material and the second strip of insulating material for establishing a connection insulator having a plurality of insulating pockets.

4,356,052

METHOD AND APPARATUS FOR SELECTIVE LAMINATION OF THERMOPLASTIC LAYERS

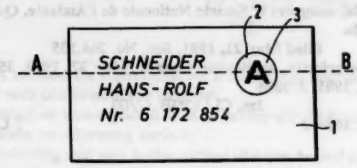
Roland Moraw, and Renate Schädlich, both of Wiesbaden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 111,033, Jan. 10, 1980. This application Apr. 10, 1981, Ser. No. 253,019

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1979, 2900978

Int. Cl.³ B30B *15/34*

U.S. Cl. 156—498 10 Claims



1. An apparatus for the selective lamination of thermoplastic layers by heating and pressurizing the internal surfaces of at least two thermoplastic layers, at least one of said layers including one window portion in which at least one insert is located, said lamination not occurring in said window portion, said apparatus comprising:

first and second lamination plates, each of said plates defining an opening corresponding to the window portion of said at least one layer;

a plug inserted in said opening of each plate;

means for thermally insulating said plugs from said plates;

means for discontinuously heating said first and second laminating plates, including resistance elements placed in said plates, said resistance elements having a greater packing density in the vicinity of the opening in each plate than in other areas of each plate; and

means for pressing said plates together with said at least two thermoplastic layers therebetween, whereby said discontinuous heating means heats external surfaces of said layers less at said window portion than at the remainder of said layers.

4,356,053

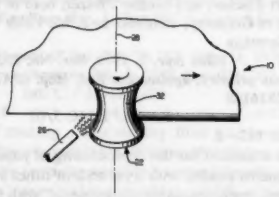
EDGE SEALING OF LAMINATE

Lewis C. LoMaglio, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed May 11, 1981, Ser. No. 262,598

Int. Cl.³ B32B *31/00*; B31F *1/00*; B32B *17/00*; B29C *17/02*

U.S. Cl. 156—499 2 Claims



1. An apparatus for encapsulating an exposed edge of an interior lamina or laminae of laminated sheet or film having separate outer thermoplastic laminae on each side of said interior lamina or laminae comprising means for heating the edge of said laminated sheet so that the edges of each of said separate outer thermoplastic laminae are in a molten state and means for forcing the edges of each of said separate outer laminae over the edge of said interior lamina or laminae to encapsulate the edge of said interior lamina or laminae, said means for forcing the edges of each of said outer laminae over the edge of said interior lamina or laminae comprising two roller means which contact said edges of each of said outer laminae and rotate about two axes which intersect, said roller means having concave surfaces which contact edges of each of said outer laminae and force edges of each of said outer lamina over the edge of said interior lamina or laminae to encapsulate the edge of said interior lamina or laminae.

4,356,054

DEVICE FOR FEEDING METAL-FOIL SECTIONS TO A LAMINATING STATION

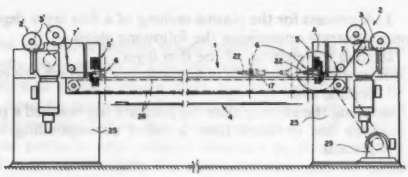
Wolfgang Götz, Krefeld-Fischeln, Fed. Rep. of Germany, assignor to G. Siempelkamp GmbH & Co., Krefeld, Fed. Rep. of Germany

Filed Aug. 7, 1980, Ser. No. 175,944

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1979, 2932698

Int. Cl.³ B32B *31/00*

U.S. Cl. 156—517 8 Claims



1. An apparatus for feeding sections of metal foil to a stacking station for subsequent lamination with respective base boards, said apparatus comprising:

a frame juxtaposed to said stacking station;

a source of metal foil on said frame;

first holding means on said frame downstream of said source relative to a path of foil transport for clamping at a first position a metal web drawn from said source;

second holding means on said frame downstream of said first holding means for clamping said web at a second position, thereby fixing a portion of said web between said positions;

slicing means on said frame between said first holding means and said second holding means for transversely cutting said web along a line extending perpendicularly to said path;

extracting means shiftably mounted on said frame for gripping a leading end of said web substantially in the region of said slicing means and pulling said web along said path from said source and past said first and said second holding means and said slicing means to move a leading section of said web into a predetermined position at said stacking station;

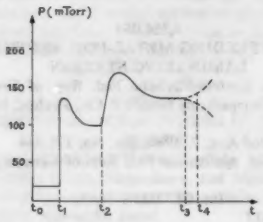
a substantially horizontal upwardly facing support surface on said frame extending downstream of said source to said first holding means and having a breadth substantially equal to the width of said web, said first holding means including a first vertically reciprocatable clamping bar disposed above said surface and extending in a direction perpendicular to said path, said second holding means including a second and a third vertically reciprocatable clamping bar spaced apart from said first clamping bar along said path and straddling same, said slicing means including a vertically reciprocatable blade, said extracting means being positioned to reach between said second and third bars.

4,356,055

PROCESS AND DEVICE FOR MONITORING THE PLASMA ETCHING OF THIN LAYER UTILIZING PRESSURE CHANGES IN THE PLASMA

Michel Montier, Grenoble, France, assignor to Societe pour L'Etude et la Fabrication de Circuits Integres Speciaux EFCIS, Grenoble, France

Filed Jul. 22, 1981, Ser. No. 285,332
Claims priority, application France, Jul. 24, 1980, 80 16329
Int. Cl.³ H01L *21/306*
U.S. Cl. 156—626 3 Claims



1. A process for the plasma etching of a thin layer deposited on a substrate comprising the following steps:

starting the etching, of the thin layer

measuring the pressure in an enclosure in which the etching occurs, and

stopping the etching after the pressure has reached a plateau then has deviated from a value corresponding to this plateau.

4,356,056

PROCESS FOR INSULATING THE INTERCONNECTIONS OF INTEGRATED CIRCUITS

Andre Cornette, and Georges Rey, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Feb. 18, 1981, Ser. No. 235,707
Claims priority, application France, Feb. 22, 1980, 80 03974
Int. Cl.³ H01L *21/306, 21/312;* C23F *1/02*
U.S. Cl. 156—649 10 Claims

1. A process for insulating the interconnections of integrated circuits having components formed in an active layer raised on mesa-like islands on a substrate supporting the same comprising the following succession of steps:

(a) applying to the substrate a semi-conducting layer of the desired component material;

(b) depositing on said layer at least one metal to form a protective layer over the region of said component; said metal deposit being photo-lithographically defined;

(c) undercutting said metal and semiconducting layers about the component to form a mesa;

(d) chemically treating the substrate and the semiconducting layer under the metal layer to attack the periphery of the mesa, and underetch the metal layer;

(e) depositing a dielectric layer, by low-temperature cathode spraying, over the metal layer and substrate but without spraying the lower periphery of the metal deposit underetched during the preceding step, thereby leaving the same exposed; and

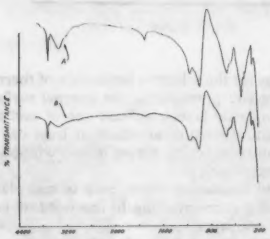
(f) chemically treating the dielectric layer and the metal layer which cover each component to eliminate the same by chemical attack of the metal, said attack beginning at the exposed lower periphery of the metal layer, the dielectric deposit on the substrate being unattacked, whereby to protect the sides of the mesa carrying the semiconducting layer.

4,356,057

PHOSPHATED ASBESTOS FIBERS

Jean M. Lalancette, and Jacques Dunnigan, both of Sherbrooke, Canada, assignors to Societe Nationale de l'Amiante, Quebec, Canada

Filed May 21, 1981, Ser. No. 266,135
Claims priority, application Canada, May 27, 1980, 352938; Apr. 29, 1981, 375388
Int. Cl.³ C03B *37/00*
U.S. Cl. 162—3 7 Claims



1. A process for preparing a modified chrysotile asbestos fiber containing from 0.5 to 5% by weight of phosphate groups, which comprises contacting chrysotile asbestos fibers under dry conditions and agitation with vapors of a phosphorous compound selected from the group consisting of phosphorous oxychloride and phosphorous pentachloride in an atmosphere inert to the phosphorous compound whereby a portion of the hydroxyl groups of the asbestos fiber are converted to phosphate groups, the amount of said phosphate groups being from 0.5 to 5% by weight of the fiber.

4,356,058

PROCESS FOR THE REPROCESSING OF PAPERS

Siegbert Fischer, and Lothar Pfalzer, both of Heidenheim, Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Fed. Rep. of Germany

Filed Apr. 2, 1979, Ser. No. 25,930
Claims priority, application Fed. Rep. of Germany, Apr. 14, 1978, 2816148
Int. Cl.³ D21C *5/02*
U.S. Cl. 162—5 6 Claims

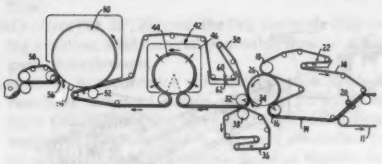
1. In a method for the reprocessing of papers which contain components coated with dyes and/or other substances, particularly microencapsulated components, with the use of bleaching agents and by dissolving the paper in a pulper in the presence of collectors and/or dispersing agents and by flotation or washing, the improvement which comprises (a) dissolving the paper in the pulper at room temperature without addition of alkali and in a neutral pH range of from about 6.5 to 7.5 and a dwell time of about 10 to 20 minutes, whereupon the dissolved pulp is fed to the flotation or washing zone and subsequently treated with a bleaching agent.

4,356,059

HIGH BULK PAPERMAKING SYSTEM

Ronald E. Hostetler, Vancouver, Wash., assignor to Crown Zellerbach Corporation, San Francisco, Calif.

Filed Nov. 16, 1981, Ser. No. 322,109
Int. Cl.³ B21F 1/12
U.S. Cl. 162—111 8 Claims



1. A method for manufacturing a bulky, soft and absorbent paper web comprising the steps of:

forming an uncompacted web of principally lignocellulosic fibers on a forming surface;

transferring said web to the surface of a first heated cylinder;

compacting said web substantially overall while on said first heated cylinder surface to partially dewater said web;

conveying said partially dewatered web to a wet embossing nip formed between a dewatering felt and an open mesh imprinting fabric formed of woven filaments having spaced compaction elements and defining voids between the filaments;

while the web is in said wet embossing nip impressing said web against said fabric whereby from about 5% to about 50% of said web will be compacted by said compaction elements and from about 50% to about 95% of said web will be impressed into the voids;

retaining the web on said imprinting fabric after the web passes through the wet embossing nip;

removing the web from the imprinting fabric before final drying thereof by applying the web to a creping surface of a second heated cylinder; and

creping the web from said second heated cylinder creping surface.

4,356,060

INSULATING AND FILLER MATERIAL COMPRISING CELLULOSE FIBERS AND CLAY, AND METHOD OF MAKING SAME FROM PAPER-MAKING WASTE

Edwin F. Neckermann, 3004 Duke, Kalamazoo, Mich. 49008, and Joseph F. Wooding, Rte. 1, Box 107-0, Grand Junction, Mich. 49056

Continuation-in-part of Ser. No. 74,718, Sep. 12, 1979, abandoned. This application Feb. 6, 1981, Ser. No. 231,963
Int. Cl.³ D21F 1/66
U.S. Cl. 162—181.6 9 Claims

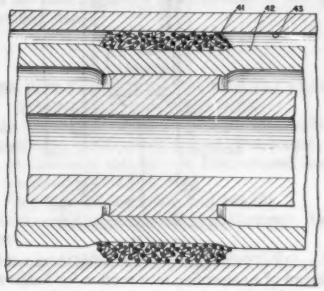
1. A method of making a low density filler and insulating material from sludge comprising a mixture of cellulose fibers and clay obtained by partially removing water from the white water slurry of a paper-making machine which comprises heating and agitating said sludge mixture at a temperature of at least 300° F. but below the temperature at which the destruction of the cellulose fibers takes place, and for a time sufficient to convert the sludge mixture to granules that are substantially non dispersible and substantially non absorbable in water and milling said granules while forcing said granules through a −5/64 inch mesh screen.

4,356,061

GAMMA THERMOMETER HAVING COMBINED THERMAL BRIDGE AND CENTERING MEANS

Robert D. Smith, Bethesda, Md., and Pierre Regazzoni, Boulogne-Billancourt, France, assignors to Scandpower, Inc., Bethesda, Md.

Filed Jun. 13, 1979, Ser. No. 48,033
Int. Cl.³ G21C 17/00
U.S. Cl. 376—254 10 Claims



1. For use with a gamma sensor positioned within a tubular guide of a fuel assembly in a nuclear reactor, said sensor having an elongated gamma heated body having axially spaced reduced diameter portions and provided with relatively hot and cold regions said hot regions being located at said reduced diameter portions, said reduced diameter portion providing heat flow in substantially the axial direction, and an outer sheath in thermal contact with said body along the cold region thereof to establish axially symmetrical heat distribution therein in response to uniform external cooling of the outer sheath within an annular gap between said outer sheath and the tubular guide, the improvement residing in thermal bridge means engageable with the tubular guide within the annular gap for establishing thermal contact between the outer sheath and the tubular guide, and means mounting the thermal bridge means on the outer sheath in axially spaced adjacency to the hot region of the body for preventing disturbance of said symmetrical heat distribution by poor thermal contact in said gap between the outer sheath and the tubular guide.

4,356,062

RACK FOR STORING BUNDLES OF NUCLEAR FUEL ELEMENTS

Ernst Bosshard, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

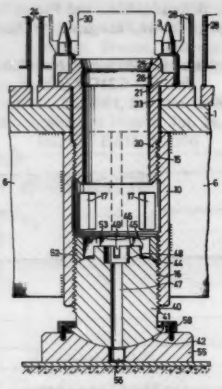
Filed Apr. 11, 1980, Ser. No. 139,343
Claims priority, application Switzerland, Apr. 23, 1979, 3807/79; May 31, 1979, 5087/79
Int. Cl.³ G21C 19/20
U.S. Cl. 376—272 21 Claims

1. A rack for storing bundles of nuclear fuel elements in a water tank, said rack comprising

a base plate having a predetermined pattern of holes therein;

a plurality of tube sections on an underside of said base plate, each said tube section being disposed coaxially with one of at least the four farthest apart holes of said pattern of

holes, each said tube section having a first screw-thread at an end remote from said base plate; and



a plurality of feet, each said foot being threaded into a screw-thread of a respective tube section for longitudinal adjustment therein through a respective hole.

4,356,063

PRE-HEATED COAL SUPPLY SYSTEM FOR A COKING OVEN BATTERY

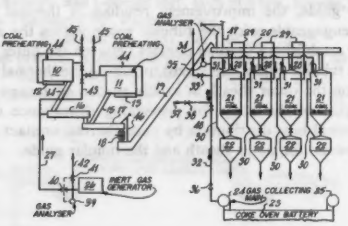
David B. Corry, Blackpool, England, assignor to Otto-Simon Carves Limited, Stockport, England

Filed Oct. 2, 1980, Ser. No. 193,073

Claims priority, application United Kingdom, Oct. 12, 1979, 7935523

Int. Cl.³ C10B 5/00

U.S. Cl. 201—41 **9 Claims**



1. A method of operating a conveying and/or storage system for supplying pre-heated coal to a coking oven battery, comprising the steps of supplying inert gas to said conveying and/or storage system and discharging therefrom a mixture of inert and combustible gases, said discharged gas mixture being passed directly to a gas collecting main of the coking oven battery without passing through the coking oven battery to which the pre-heated coal is separately supplied substantially without the inert gas.

4,356,064

FUMES CONTROL SYSTEM DUCT AND CAR ARRANGEMENT

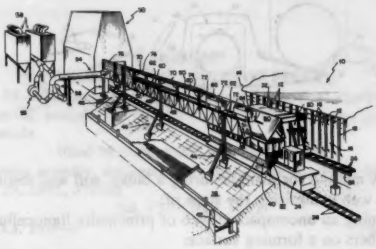
Pramodh Nijhawan, Indianapolis, and Joseph M. Duckworth, Zionsville, both of Ind., assignors to The Bahnson Company, Winston-Salem, N.C.

Filed Mar. 12, 1979, Ser. No. 19,650

Int. Cl.³ C10B 33/00

U.S. Cl. 202—263 **4 Claims**

1. In a contaminant control system including suction means, a duct, means for coupling the suction means to the duct for evacuation thereby, the duct including a wall portion closed by a flexible web, the duct further including means for supporting the web against collapse into the duct under such evacuation, a first car disposed for movement along the duct to raise the web to couple the interior of the first car to the interior of the duct, means for guiding the first car along the duct, and means for connecting the interior of the first car to an area containing



contaminants to be evacuated, a second car disposed for movement along the duct, and means for guiding the second car along the duct, the second car including means for raising the web to couple the interior of the second car to the interior of the duct, and a door in the second car for providing access to the interior of the second car for entry into the duct for inspection.

4,356,065

POLAROGRAPHIC OXYGEN CONCENTRATION SENSOR AND METHOD OF DETERMINING OXYGEN CONTENT IN THE EXHAUST GASES OF AN INTERNAL COMBUSTION ENGINE

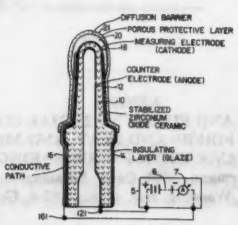
Hermann Dietz, Gerlingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 6,093, Jan. 4, 1979, abandoned, which is a continuation-in-part of Ser. No. 885,368, Mar. 13, 1978, abandoned. This application Dec. 4, 1980, Ser. No. 213,049

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1977, 2711880

Int. Cl.³ G01N 27/58

U.S. Cl. 204—1 T **8 Claims**



1. Polarographic oxygen concentration sensor to sense concentration of oxygen in gas exhaust from a combustion engine having

a solid electrolyte body (10, 10') shaped to provide two oppositely located surfaces;

a gas permeable first electrode (18, 18') applied to one surface of the body, said first surface being adapted to be exposed to the gas in which the oxygen concentration is to be sensed;

a second gas permeable electrode (12, 12') applied to the other surface of the body (10, 10'), said second surface being adapted to be exposed to a reference gas having a known concentration of oxygen,

whereby the body will be intermediate said electrodes (18, 12) and separate the test gas and the reference gas;
means (6, 127, 161) applying a voltage across said electrodes to cause a current to flow in dependence on the electrode reaction with oxygen in the gas reaching said first electrode in the range of between about ½ to 1½ volts;
means (7) obtaining a signal representative of said current flow;
and a cover (20, 20', 21) over the first electrode (18) comprising a porous, solid material permitting flow, or diffusion of gases therethrough;
said cover, in accordance with the invention, comprising
a two-layer structure having an outer porous protective layer (21) and an inner layer (20, 20') forming a gas flow barrier to permit migration of only a controlled quantity of oxygen molecules therethrough and thereby limit the quantity of oxygen molecules reaching said first electrode (18, 18'),
said inner layer of the cover being characterized by being of such porosity and thickness that the relationship of cross section of the pores and path length for oxygen molecules with respect to the diffusion limited current at the first electrode is defined by

$$I_{lim}=z\cdot F\cdot D\cdot(q/d)\cdot C$$

wherein I_{lim} is the limit current; z·F the charge conversion by the electrode reaction, z defining the charge conversion for oxygen and being equal to 4; F is the Faraday constant; D the diffusion coefficient; q the diffusion cross section; d the diffusion length; and C the concentration of oxygen in the gas.

5. Method of obtaining an analog electrical output representative of oxygen in exhaust gas from a combustion engine having an electrochemical cell exposed to the sample gas,
said cell having
a solid electrolyte body (10, 10') shaped to provide two oppositely located surfaces;
a gas permeable first electrode (18) applied to one surface of the body;
a second gas permeable electrode (12) applied to the opposite surface of the body (10, 10'),
whereby the body will be intermediate said electrodes (8, 12)
comprising the steps of
supplying said gas, the oxygen concentration of which is to be sensed, to the first electrode;
providing an oxygen environment at said second electrode;
applying a voltage across said first and second electrodes at a level in the range of about ½ to 1½ volts;
controlling the magnitude of said voltage to establish said electrochemical cell in a diffusion limited current mode of operation, wherein variations in the oxygen partial pressure of the gas, the oxygen concentration of which is to be determined and to which the first electrode is exposed, produces changes in electrochemical cell current;
measuring said current as an indication of the oxygen partial pressure of said gas;
and including the further step of
limiting the quantity of oxygen molecules migrating to, and reaching said first electrode (18, 18') to that value at which any oxygen molecule, within the gas reaching said first electrode, is immediately converted by electrode reaction, by throttling access of said gas to said first electrode (18),
said throttling step comprising passing said gas through a flow or migration resistance path having a path-limiting current relationship defined by:

$$I_{lim}=z\cdot F\cdot D\cdot(q/d)\cdot C$$

wherein I_{lim} is the limit current, z·F the charge conversion by the electrode reaction, z defining the charge conversion for oxygen and being equal to 4; F is the Faraday constant; D the diffusion coefficient; q the diffusion cross section; d the diffusion length; and C the concentration of oxygen in the gas;
to effect immediate conversion by electrode reaction of any oxygen molecules migrating to, and reaching said first electrode (18, 18');
and protecting said flow or migration resistance path by passing the gas flow through a porous protective path layer (21) prior to said throttling step, the flow resistance of the gas flow through the protective path layer being less than the flow resistance upon passage of said gas in said throttling step.

4,356,066

PROCESS FOR FABRICATING A MULTI-LAYER MAGNETIC THIN FILM DISK

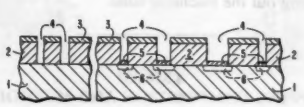
Helmut Kienle, Boeblingen; Gerhard E. Schmid, Stetten; Werner Steiner, Boeblingen, and Gerhard Trippel, Sindelfingen, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 30, 1981, Ser. No. 248,141

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1980, 3014718

Int. Cl.³ G11B *5/66, 5/84;* C25D *11/04*

U.S. Cl. 204—38 A **5 Claims**



1. A method for producing a multi-layer thin film magnetic disk on an aluminum-containing substrate comprising the steps of
depositing on said substrate a synthetic resin layer, said resin layer having a plurality of pin holes therein which expose said substrate;
passivating said aluminum in said substrate in the areas exposed by said pin holes to produce an aluminum oxide layer so that said substrate is no longer exposed through said substrate; and
depositing a metallic magnetic layer on said resin layer.

4,356,067

ALKALINE PLATING BATHS AND ELECTROPLATING PROCESS

Ewald H. McCoy, Brookfield, Wis., assignor to Electrochemical Products, Inc., New Berlin, Wis.

Continuation-in-part of Ser. No. 48,265, Jun. 13, 1979, abandoned. This application Jul. 17, 1980, Ser. No. 169,752

Int. Cl.³ C25D *3/56*

U.S. Cl. 204—43 Z **8 Claims**

1. A cyanide-free plating bath for the electrodeposition of copper and zinc alloys consists of:
(a) an aqueous alkaline mixture of copper and zinc ions having a pH of about 10 to about 13.5; and
(b) a chelating agent selected from glucoheptonic acid and salts thereof, said agent being present in an amount which is about 10 grams to about 75 grams per liter.

7. The method of electrodepositing a copper and zinc alloy upon a conductive surface of an object which comprises connecting the conductive surface to the negative end of a source of electricity, placing the conducting surface in a plating bath of claim 1, placing into the same plating bath an anode which is of the same composition as the desired plate to be deposited and which is connected to a positive end of a source of electricity and then passing an electrical current through the plating bath so that the copper and zinc ions in the bath are deposited upon the conductive surface.

4,356,068

PERMIONIC MEMBRANE

William B. Darlington, Portland, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 15,521, Feb. 23, 1979, Pat. No. 4,272,337. This application Nov. 17, 1980, Ser. No. 207,593
Int. Cl.³ C25B *1/34, 13/02, 13/08*
U.S. Cl. 204—98 12 Claims

1. In a method of conducting electrolysis in an electrolytic cell having an anolyte compartment with an anode therein, a catholyte compartment with a cathode therein, and an electrolyte impermeable, cation selective, permionic membrane therebetween, said cathode being in contact with the permionic membrane, which method comprises feeding alkali metal chloride brine to the anolyte compartment, passing an electrical current from the anode to the cathode, evolving chlorine at the anode and hydroxyl ion at the cathode, the improvement wherein the anodic surface of the permionic membrane is an imporous surface, the cathodic surface of the permionic membrane comprises microporous channels of permionic membrane material within the cation selective permionic membrane, and wherein said microporous channels are prepared by the process comprising:

a. hot pressing a leachable solid in and on the cathodic surface of the permionic membrane; and

b. leaching out the leachable solid.

4,356,069

STRIPPING COMPOSITION AND METHOD FOR PREPARING AND USING SAME

Ross Cunningham, 508 Ridge Ct. East, Old Hickory, Tenn. 37138

Filed Mar. 9, 1981, Ser. No. 241,889
Int. Cl.³ C25F *5/00*
U.S. Cl. 204—146 3 Claims

1. A method for stripping chromium or nickel from the surface of a chromium or nickel plated metal substrate selected from the group consisting of zinc, steel, aluminium, brass and copper, comprising:

(a) immersing said plated metal substrate in a bath containing an aqueous solution of chromic acid, peroxide, and sulfuric acid in sufficient concentrations to remove said chromium or nickel from said plated metal substrate in a reverse current stripping process,

(b) immersing a metal cathode in said bath,

(c) applying a positive potential to said plated metal substrate and a negative potential to said metal cathode with a direct current therebetween at a sufficient current density and for a sufficient period of time to strip said chromium or nickel from said plated metal substrate, and

(d) removing the stripped metal substrate from said bath.

4,356,070

METHOD FOR SYNTHESIZING POLY(CARBONYL FLUORIDE) OLIGOMERS

Keith B. Baucom, Gainesville, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 17, 1981, Ser. No. 274,574
Int. Cl.³ B01J *19/12*
U.S. Cl. 204—158 R 4 Claims

1. A method for preparing poly(carbonyl fluoride) oligomers comprising the steps of:

A. subjecting a mixture of F-3-methylbutene-1 and gaseous oxygen to a source of ultraviolet radiation for a period of time sufficient to effect a photolytic reaction between the components of said mixture; and

B. separating the resulting reaction products.

4,356,071

THERMALLY STABLE POLYOXYMETHYLENE CONTAINING POLYMERS

Jeff T. Fenton, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Dec. 14, 1981, Ser. No. 330,530
Int. Cl.³ C08G *2/02*
U.S. Cl. 204—159.21 7 Claims

1. A method for producing thermally stable polyoxymethylene-containing polymers formed by the polymerization of formaldehyde and/or trioxane, the method comprising treating said formaldehyde and/or trioxane with microwave radiation prior to use in a polymerization reaction.

4,356,072

ISOELECTRIC POINT MARKER

Hiraku Saito, Osaka; Isamu Takagahara, Kawanishi; Yasuo Suzuki, Suita; Tuyosi Fujita, Suita; Katsumi Fujii, Suita, and Takekazu Horio, Takatsuki, all of Japan, assignors to Oriental Yeast Company, Tokyo, Japan

Continuation-in-part of Ser. No. 41,190, May 21, 1979, abandoned. This application Dec. 18, 1980, Ser. No. 217,917
Claims priority, application Japan, May 31, 1978, 53-64357
Int. Cl.³ B01D *57/02*
U.S. Cl. 204—180 G 8 Claims

1. An isoelectric point marker, comprising a mixture of a predetermined number greater than 2 of separated and purified compounds comprised cytochrome c acetylated or succinylated by 1–18 acetyl or succinyl groups, wherein both groups may be present on the same compound, and wherein each compound of said mixture is a single purified compound having a known type and number of said acetyl or succinyl groups, and therefore a single known isoelectric point, and wherein each said compound in said mixture is present in a predetermined amount.

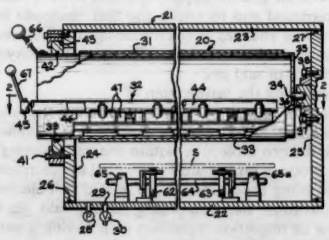
7. In the method of gel isoelectric separation comprising passing electricity through an isoelectric separation gel to produce a pH-gradient therein, the improvement comprising adding the isoelectric point marker in accordance with claim 1 to said gel prior to the step of passing electricity therethrough, whereby, after said step of passing the electricy therethrough, colored bands are formed in said gel at the isoelectric point of each of the compounds in said marker.

4,356,073

MAGNETRON CATHODE SPUTTERING APPARATUS

Harold E. McKelvey, Plymouth, Mich., assignor to Shatterproof Glass Corporation, Detroit, Mich.

Filed Feb. 12, 1981, Ser. No. 233,974
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—192 R 12 Claims



1. A method of sputtering thin films of a selected coating material upon substantially planar substrates, in which there is provided an evacuated coating chamber enclosing an elongated, cylindrical tubular member having a layer of the coating material to be sputtered applied to the outer surface thereof, establishing within said tubular member a magnetic field to

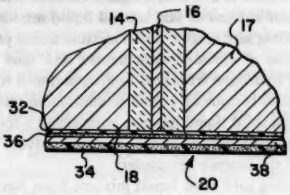
provide an erosion zone on the coating material extending substantially the entire length of the tubular member and circumferentially along a relatively narrow region thereof, rotating said tubular member about its longitudinal axis to bring different portions of the coating material into sputtering position opposite the magnetic field, and moving the substantially planar substrates horizontally beneath said erosion zone in a linear path to receive the sputtered material.

4,356,074

SUBSTRATE SPECIFIC GALACTOSE OXIDASE ENZYME ELECTRODES

Jay M. Johnson, Dayton, Ohio, assignor to The Yellow Springs Instrument Company, Inc., Yellow Springs, Ohio

Filed Aug. 25, 1980, Ser. No. 181,459
Int. Cl.[3] G01N *27/54*; C12Q *1/00, 1/54*
U.S. Cl. 204—195 P 11 Claims



1. A thin layer electrochemical cell capable of controlling the relative specificity of an enzyme for various substrates for use in rapid, direct analytical analysis of those substrates comprising:

a first outer membrane layer adapted to be adjacent a substrate solution for allowing passage of low molecular weight materials into said cell but excluding high molecular weight materials contained in said substrate solution,

second inner membrane layer adapted to be adjacent to a polarographic cell for excluding passage of interfering low molecular weight materials and any mediator but permitting the passage of the electroactive reactant or product of the reaction between said substrate or substrates and an enzyme,

an enzyme preparation positioned between said first and second membrane layers, said enzyme being one which is subject to redox potential control, and

an electrically conductive layer between said first and second membrane layers and contacting said enzyme preparation, said electrically conductive layer connected to a potential control means capable of varying the electrical potential of said enzyme preparation,

said cell being thin and capable of use in rapid, direct analytical analysis of said substrates.

10. In a polarographic cell structure for use in polarographic analysis of a substrate in a substrate solution comprising a polarographic electrode means mounted with said polarographic cell structure, said polarographic electrode means including means defining an active exposed working face, the improvement comprising:

a thin layer electrochemical cell separating said polarographic electrode means from said substrate solution, said thin layer electrochemical cell having,

a first outer membrane layer adapted to be adjacent the substrate solution for allowing passage of low molecular weight materials into said cell but excluding high molecular weight materials contained in said substrate solution,

second inner membrane layer adapted to be adjacent to a polarographic cell for excluding passage of interfering low molecular weight materials but permitting the passage of the electroactive reactant or product of the reaction between said substrate(s) and an enzyme,

an enzyme preparation positioned between said first and second membrane layers, said enzyme being one which is subject to redox potential control, and

an electrically conductive layer between said first and second membrane layers and contacting said enzyme preparation, said electrically conductive layer connected to a potential control means capable of varying the electrical potential of said enzyme preparation,

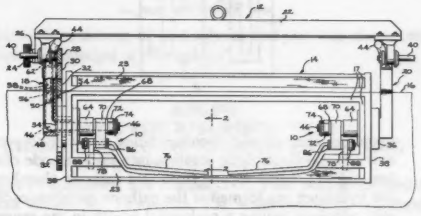
said thin layer electrochemical cell rendering said polarographic cell structure capable of rapid, direct analytical analysis for said substrate.

4,356,075

RIGID DANGLER ASSEMBLY FOR ELECTROPLATING BARRELS

George A. Case, Lexington, Ky., assignor to Case Engineering Consulting Company, Lexington, Ky.

Filed Jun. 29, 1981, Ser. No. 278,165
Int. Cl.[3] C25D *17/20, 17/10*
U.S. Cl. 204—213 10 Claims



1. In an electroplating system of the type which includes a rotatable, hollow barrel adapted for submersion in a liquid electrolyte solution, and a pair of hanger arms connected by means of rotatable collars disposed within hubs located on opposite end walls of said barrel, a pair of dangler assemblies disposed in said barrel, each of which assemblies comprises:

a rigid L-shaped electrically conductive rod having a vertically extending end portion disposed in a guideway on one of said hanger arms and a horizontally extending end portion projecting through one of said hubs and collars into the interior of said barrel,

first electrically conductive counter-balancing means slippably mounted on said rod and having a center of gravity below the level of said rod,

a rigid, elongated electrically conductive dangler arm having one end portion slippably connected to said counterbalancing means below the center of gravity thereof and an opposite end portion projecting along a lower portion of said barrel toward a vertical centerline thereof,

means for electrically connecting said rod to a remote source of d.c. potential, and

means for protecting a portion of said rod and electrically connecting means from exposure to said solution to inhibit the plating of said rod portion and electrically connecting means during successive electroplating operations employing said system.

4,356,076

APPARATUS FOR THE ANODIC OXIDATION OF ALUMINUM

Shizuo Matsushita, and Yasuhito Togawa, both of Tokyo, Japan, assignors to Director-General of Agency of Industrial Science and Technology, Tokyo, Japan

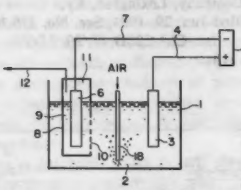
Filed Aug. 22, 1980, Ser. No. 180,455
Claims priority, application Japan, Aug. 22, 1979, 54-106969
Int. Cl.[3] C25D *17/00, 21/10*; C25B *1/10, 9/00*
U.S. Cl. 204—261 2 Claims

1. In an apparatus for the anodic oxidation of an aluminum piece, including a cell for containing an electrolytic solution,

an anode member of the aluminum piece adapted to be electrically connected to the positive pole of a direct-current source and immersed in the electrolytic solution, and a cathode member adapted to be electrically connected to the negative pole of the direct-current source and immersed in the electrolytic solution so that the aluminum piece may be oxidized with the simultaneous formation of hydrogen gas at the cathode member when the aluminum piece and the cathode member are immersed in the electrolytic solution and a voltage is impressed therebetween, the improvement comprising:

an impervious tubular partition member surrounding and spaced from said cathode member to define a cathode chamber, said partition having an aperture at a lower portion;

a net member covering said aperture to provide a plurality of



openings, each of said openings being of a size to permit entry of the electrolytic solution into said cathode chamber and to prevent escape from said cathode chamber of the hydrogen gas formed at the cathode member, each of said openings having a peripheral length in the range of 80μ to 1200μ;

means closing the upper end of said partition member to form an enclosed space above the surface of the electrolytic solution in said cathode chamber with the partition member immersed in the electrolytic solution, said hydrogen gas being collected within the enclosed space;

conduit means opening into said enclosed space for removing and recovering the hydrogen gas collected therewithin; and

means for introducing an air stream into the electrolytic solution to agitate the solution.

4,356,077

PYROLYSIS PROCESS

Stanley C. Che, Los Alamitos, Calif., assignor to Occidental Research Corporation, Irvine, Calif.

Filed Dec. 31, 1980, Ser. No. 221,949
Int. Cl.³ C10G *1/00*; C10B *51/00*
U.S. Cl. 208—8 R **15 Claims**

1. A process for producing light aromatics, intermediate coal liquids, tar acids, and heavy hydrocarbons by the pyrolysis of coal comprising:

(a) pyrolyzing coal at a pyrolysis temperature by introducing said coal, a carbon containing particulate solid source of heat which has been heated to a temperature higher than said pyrolysis temperature, and a beneficially reactive gas into a pyrolysis zone under conditions of time and elevated temperature sufficient to produce therefrom a pyrolysis product comprising particulate solids and pyrolytic vapors, said particulate solids comprising said carbon containing particulate solid source of heat and a char product produced from said coal, said beneficially reactive gas being operative to reduce the polymerizing or cracking of said pyrolytic vapors by inhibiting the reactivity of said char product and said carbon containing particulate solid source of heat;

(b) separating said particulate solids from a gaseous mixture which comprises said pyrolytic vapors, said beneficially reactive gas, and any other gases which are mixed therewith to form a substantially solids-free gaseous mixture;

(c) contacting said substantially solids-free gaseous mixture, which comprises said pyrolytic vapors, in a quench zone with a quench liquid comprising a hydrogen donor solvent, under predetermined conditions of temperature, time and ratio of quench liquid to pyrolytic vapors operative to form a product gas and a first liquid mixture which comprises said hydrogen donor solvent and a pyrolytic condensate formed from said pyrolytic vapors by condensation thereof, said pyrolytic condensate comprising tar acids and a condensate remainder;

(d) separating said first liquid mixture from said product gas;

(e) separating said first liquid mixture by vacuum flashing in a vacuum flashing zone into at least a first vapor comprising at least a major part of said tar acids, and a second liquid mixture comprising at least a major part of said quench liquid and said hydrogen donor solvent and also comprising at least a major part of said condensate remainder;

(f) hydrogenating said condensate remainder in said second liquid mixture in a first hydrogenation zone with said hydrogen donor solvent in said second liquid mixture by heating and holding said second liquid mixture under predetermined conditions of elevated temperature and time operative to transfer hydrogen from said hydrogen donor solvent to said condensate remainder in said second liquid mixture thereby forming a third liquid mixture comprising a spent hydrogen donor solvent, unused hydrogen donor solvent and a hydrogenated condensate remainder;

(g) separating said third liquid mixture from step (f) in a first separation zone into at least a heavy hydrocarbon raffinate comprising at least a major part of heavy hydrocarbons contained in said hydrogenated condensate remainder and a fourth liquid mixture comprising at least a major part of said spent hydrogen donor solvent, said unused hydrogen donor solvent, and a residue of said hydrogenated condensate remainder;

(h) condensing and separating said first vapor, from said vacuum flashing zone of step (e), in a second separation zone, into a fifth liquid mixture comprising at least a major part of said tar acids, and a sixth liquid mixture which comprises a tar acid raffinate;

(i) introducing said fourth liquid mixture from said first separation zone of step (g), and said sixth liquid mixture from said second separation zone of step (h), into a third separation zone and separating said fourth and sixth liquid mixtures into, and forming, at least a seventh liquid mixture comprising at least a major part of light aromatics contained in said residue of said hydrogenated condensate remainder and said tar acid raffinate, an eighth liquid mixture comprising at least a major part of intermediate coal liquids contained in said residue of said hydrogenated condensate remainder and said tar acid raffinate, and a ninth liquid mixture comprising at least a major part of two- and three-ring aromatics contained in said residue of said hydrogenated condensate remainder and said tar acid raffinate, and at least the major part of said spent hydrogen donor solvent and unused hydrogen donor solvent contained in said fourth liquid mixture;

(j) hydrotreating said ninth liquid mixture from said third separation zone of step (i), in a second hydrogenation zone with a gas comprising gaseous hydrogen under conditions operative to produce a tenth liquid mixture comprising two- and three-ring hydroaromatics and a hydrogenated spent hydrogen donor solvent, both of which are operative for use in said quench zone as quench liquid and subsequently in said first hydrogenation zone as hydrogen donor solvent, and unused hydrogen donor solvent; and

(k) utilizing said tenth liquid mixture from said second hydrogenation zone of step (j) as at least a major part of said quench liquid, which comprises a hydrogen donor solvent, used in said quench zone of step (a).

4,356,078

PROCESS FOR BLENDING COAL WITH WATER IMMISCIBLE LIQUID

Leonard J. Heavin, Olympia; Edward E. King, Gig Harbor, and Dennis L. Milliron, Lacey, all of Wash., assignors to The Pittsburg & Midway Coal Mining Co., Englewood, Colo.

Filed Sep. 8, 1980, Ser. No. 184,762
Int. Cl.³ C10G 1/00
U.S. Cl. 208—8 LE 26 Claims

1. A continuous process for blending pulverized coal with a water immiscible liquid to form a pumpable slurry, which comprises

continuously feeding pulverized raw feed coal and a water immiscible liquid to a blending zone in which coal particles and liquid are intimately admixed and advanced in substantially plug flow such that the resulting slurry passes through said blending zone without substantial backmixing to form a first slurry;

withdrawing said first slurry from said blending zone and passing it to a separate feed mixing zone where said first slurry is mixed with a hot, second slurry to form a pumpable third slurry of generally uniform consistency; and

withdrawing said pumpable third slurry from said feed mixing zone and continuously recycling a first portion of said pumpable third slurry directly to said blending zone to provide at least a portion of the said water immiscible liquid and passing a second portion of said pumpable third slurry to a preheating zone of a coal liquefaction process.

4,356,079

DENITRIFICATION OF HYDROCARBON FEEDSTOCK

Ralph M. Desaau, Edison, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 4, 1980, Ser. No. 156,283
Int. Cl.³ C10G 17/00, 23/02
U.S. Cl. 208—10 17 Claims

1. A process for denitrification of a heavy hydrocarbon feedstock having a boiling range above about 400° F. which comprises hydrofining the feedstock at a temperature between about 500° F. and 850° F. in the presence of between about 0.1 and 5 weight percent of water, based on the weight of feedstock, and in contact with an acidic zeolite catalyst having a metallic hydrogenation component incorporated therein.

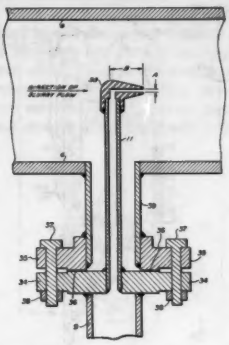
4,356,080

SOLVENT DEOILING APPARATUS AND PROCESS

Edward A. Pullen, Fullerton, and Thomas Hallis, Jr., Brea, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Continuation of Ser. No. 848,746, Nov. 4, 1977, abandoned. This application Jun. 13, 1979, Ser. No. 48,133
Int. Cl.³ C10G 73/06
U.S. Cl. 208—31 34 Claims

1. In a solvent deoiling process wherein an oil-containing wax feedstock is passed through a series of scraped chillers to produce a product slurry containing crystallized wax that is subsequently separated from said oil to produce a fully refined petroleum wax, and wherein the solvent is added incrementally into conduits carrying wax slurry from one chiller to the next, the improvement comprising injecting incrementally added solvent directly into a plurality of said conduits at linear velocities producing within each conduit of said plurality a turbulent mixing zone, said turbulent mixing zones being of sufficiently high agitation such that substantially uniform and



instantaneous mixing of said solvent and the wax slurry into which it is injected is effected.

4,356,081

CATALYTIC REFORMING WITH RHENIUM-PLATINUM CATALYST CONTAINING MORE RHENIUM THAN PLATINUM

James P. Gallagher, 325 Indiana Ave., Park Forest, Ill. 60466, and Robert M. Yarrington, 320 Wychwood Rd., Westfield, N.J. 07090

Continuation of Ser. No. 894,890, Apr. 10, 1978, abandoned. This application Apr. 28, 1980, Ser. No. 144,137
Int. Cl.³ C10G 35/06
U.S. Cl. 208—139 10 Claims

1. A process for reforming a naphtha fraction, which process comprises subjecting a naphtha having a sulfur content of less than about 0.5 ppm by weight of sulfur, to contact at reforming conditions and in the presence of gaseous hydrogen with a catalytic composite consisting essentially of an alumina support; a minor catalytically effective amount of rhenium component; 0.1 to 0.4 weight percent platinum component; and a minor catalytically effective amount of at least one halogen component, the weight ratio of rhenium to platinum being in the range of from not less than 2 to about 5, whereby the relative cycle length of said catalytic composite is greater than if the rhenium to platinum ratio is outside said range.

4,356,082

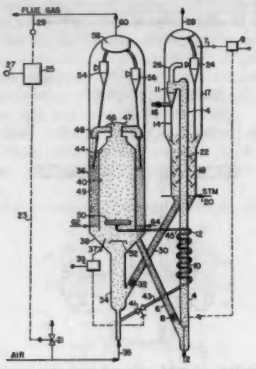
HEAT BALANCE IN FCC PROCESS

Benjamin Gross, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 18, 1980, Ser. No. 217,879
Int. Cl.³ F27B 15/10, 15/14, 15/16
U.S. Cl. 208—164 40 Claims

1. In a fluid catalytic cracking process comprising admixing a hydrocarbonaceous feed with a regenerated catalyst in the upstream section of a reactor riser, passing the hydrocarbonaceous feed and the catalyst admixed therewith through the downstream section of the riser, thereby effecting cracking of the hydrocarbonaceous feed at the process temperature under endothermic process conditions and deactivating the catalyst by deposition of carbonaceous deposits thereon, separating the deactivated catalyst from the cracked hydrocarbonaceous feed, passing the deactivated catalyst to a regenerator vessel wherein the carbonaceous deposits are removed from the deactivated catalyst under exothermic process conditions by means of a regenerating medium introduced into the regenerator vessel by a regenerating medium distribution means, thereby regenerating and heating the catalyst, and passing the

regenerated hot catalyst to the upstream section of the reactor riser, the improvement wherein at least a portion of the ther-



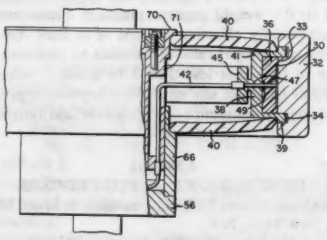
mal energy is transferred by heat exchanging means from the riser to the regenerator vessel.

4,356,083

UNBALANCED ROTOR FOR FIELD FLOW FRACTIONATION CHANNEL

William A. Romanauskas, Southbury, Conn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 1, 1981, Ser. No. 249,962
Int. Cl.³ B03B *5/62*; B04B *9/14*
U.S. Cl. 209—155 **4 Claims**



1. In an apparatus for separating particulates suspended in a fluid medium according to their effective masses, said apparatus having an annular cylindrical channel with a cylinder axis, and radially inner and outer walls defining the radial thickness of said channel, means including a hub assembly for rotating said channel about a spin axis generally parallel to said cylinder axis, means for passing said fluid medium circumferentially through said channel, and means for introducing said particulates into said medium for passage through said channel, the improvement wherein

said apparatus has at least a pair of predetermined mass regions located at different points along said cylinder axis and other than at said channel,

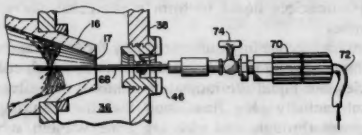
a portion of the mass in each of said predetermined regions being adjusted so that said cylinder axis approaches said spin axis above critical speeds of rotation of said channel.

4,356,084

SELF-SEALING VALVE ASSEMBLY TO FACILITATE UNPLUGGING OF A CENTRIFUGAL CLEANER

Derald R. Hatton, and David E. Chupka, both of Middletown, Ohio, assignors to The Black Clawson Company, Middletown, Ohio

Filed Apr. 6, 1979, Ser. No. 27,577
Int. Cl.³ B04C *5/18*, *5/23*
U.S. Cl. 209—211 **10 Claims**



1. A cyclone cleaning apparatus for separating a suspension of solid particles into light and heavy fractions, comprising

a columnar cyclone member of frustoconical cross section having an inlet end and an apex end,

means for introducing said suspension at said inlet end of said cyclone member to produce a high velocity, helical outer vortex of material traveling toward said apex end thereof and an inner vortex of material traveling in the opposite direction,

means defining an outlet port for the heavy particle fraction extending axially through said apex end of said cyclone member,

housing means defining an outlet chamber enclosing said apex end of said cyclone member to receive said heavy particle fraction directly from said port therein,

said housing means including an outer wall having therein an opening generally aligned with said outlet port, and

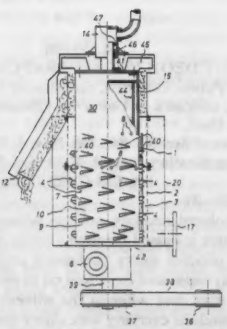
pierceable resilient means sealing said opening and positioned to receive a probe in removable piercing relation therethrough for releasing a blockage in said port.

4,356,085

ROTARY SCREENING MACHINE FOR PULP SUSPENSIONS

Werner Schön, and Albrecht Meinecke, both of Heidenheim, Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Fed. Rep. of Germany

Filed Feb. 20, 1981, Ser. No. 236,626
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1980, 3006482
Int. Cl.³ D21D *5/02*; B07B *1/20*
U.S. Cl. 209—273 **62 Claims**



1. A rotary screening machine for removing impurities from a pulp suspension of fibers, comprising:

an annular drum rotatable about an axis and having a annular periphery;

a screen basket annularly around the periphery of the drum and radially spaced therefrom for defining an annular screening slot between the drum and the screen basket;

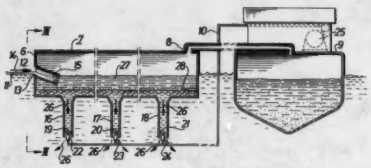
a plurality of vanes supported on the annular periphery of the annular drum; each vane having a leading end and a trailing end with respect to the direction of rotation of the drum around the axis; each vane tapering gradually wider, measured along the axis of the drum, from the leading to the trailing end thereof.

4,356,086

APPARATUS FOR RECOVERING OIL OR THE LIKE FLOATING ON A LIQUID SURFACE SUCH AS WATER

Per O. Öberg, Nordmaling, Sweden, assignor to Sanera Projecting Aktiebolag, Nordmaling, Sweden

Filed Sep. 4, 1980, Ser. No. 183,893
Claims priority, application Sweden, Sep. 11, 1979, 7907544
Int. Cl.³ E02B *15/04*
U.S. Cl. 210—115 **10 Claims**



1. In an apparatus for recovering oil, or the like, floating on the surface of a liquid, e.g. water, comprising a hollow body having an inlet opening open to flow of oil and water therethrough into said body, pump means for evacuating water which has flowed into the body in order to concentrate the oil in the body, closure means for preventing liquid flow out through said inlet opening upon forcing of water into said body for raising of the interior liquid level and therewith forcing of oil towards the upper portion of the body, and means effecting communication of said upper portion of said body with an oil receiving container for transferring oil thereto in response to said raising of said interior liquid level, the improvement comprised in that said body is adapted to float partly immersed in said liquid with said inlet opening adjacent said liquid surface for said flow of oil and water into said body, said pump means being reversible for alternately carrying out said evacuating of water from said body and forcing of water into said body, at least one pipe downwardly directed from said body into and communicating with the surrounding water, said body and pipe comprising a hollow body-pipe unit, said reversible pump means being arranged inside said body-pipe unit below said inlet opening in communication with said pipe for pumping water through said pipe from the lower portion of said body to said surrounding water and vice versa, said closure means being a member arranged for closing the inlet opening against overflow from said body in cooperation with said reverse operation of said pump.

4,356,087

RODENT BARRIER DEVICE

Robert A. Miles, Barrett, Minn.

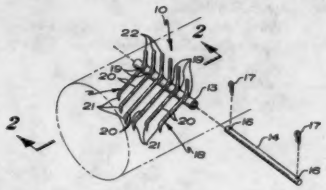
Filed Aug. 24, 1981, Ser. No. 295,840
Int. Cl.³ B01D *33/00*
U.S. Cl. 210—131 **4 Claims**

1. A barrier device for use in preventing animals, such as rodents, from entering drain tile of the type used to drain water from fields, said device comprising:

a pivot rod adapted to be positioned in a generally horizontally disposed drain tile transversely thereof so that the opposite ends of the pivot rod project through opposed registering openings in drain tile, said pivot rod having means at opposite ends thereof for retaining the pivot rod in mounted relation interiorly of the drain tile;

an elongate sleeve mounted on said pivot rod for limited pivotal movement relative thereto,

a plurality of transversely spaced apart elongate barrier elements affixed to said sleeve intermediate the respective ends of said elements for pivotal movement with the sleeve between opened and closed positions, each of said barrier elements including an upper portion extended upwardly from said sleeve and a lower portion extending forwardly and downwardly from said sleeve, the lower



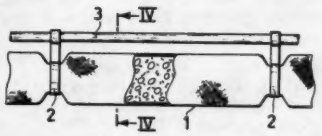
end of said lower portion of each barrier element being angularly bent and pointed, the lower portion of each barrier element having a length dimension substantially greater than the length dimension of the corresponding upper portion whereby the barrier elements normally swing downwardly and rearwardly by action of gravity to the closed position and engage the lower inner surface of the tile but may swing forwardly and upwardly in response to debris carried by water to permit said debris to pass beyond the barrier device and outwardly of the drain tile.

4,356,088

ACTIVATED DEPOLLUTION BOOM

Rolando Matteelli, and Brunello Ciuti, both of San Donato Milanese, Italy, assignors to Snamprogetti S.p.A., Milan, Italy

Filed Sep. 18, 1980, Ser. No. 188,553
Claims priority, application Italy, Oct. 12, 1979, 26444 A/79
Int. Cl.³ E02B *15/04*
U.S. Cl. 210—198.1 **7 Claims**



1. A boom which floats in water for depolluting water surfaces of crude petroleum and its derivatives, and of other oily substances, comprising:

an outer mesh fabric sheath filled with an active substance and an expanded substance, wherein the sheath has removable means thereon which close the openings in the mesh fabric of the sheath until it is in water at which time said means are removable in water so that the active substance is contained within said sheath prior to use and will migrate through the openings in the mesh fabric of said sheath to depollute the water surfaces when the boom is floating in polluted waters, wherein the active substance essentially consists of 10 to 90% by weight of a low specific gravity support, 9 to 80% of a surface active agent, and 1 to 10% by weight of a wetting agent, and wherein the expanded substance essentially consists of 5 to 80% by weight relative to the active substance of granules or flocks and keeps the boom afloat,

a cable spaced apart and alonside said filled mesh fabric sheat for supporting said sheath, and

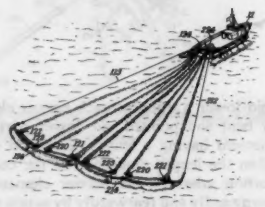
a plurality of bands spaced apart along the length of said sheath which encircle and throttle said sheath for uniform distribution of the substances therein and which are connected to said cable for support thereof.

4,356,089

RECOVERY OF OIL

Ronald T. Challener, Christchurch, and George H. Rolls, Fordingbridge, both of England, assignors to Oil Mop (U.K.) Limited, Dorset, England

Filed Nov. 3, 1980, Ser. No. 203,487
Claims priority, application Ireland, Nov. 6, 1979, 2128/79
Int. Cl.³ C02F *1/40*
U.S. Cl. 210—242.4 **14 Claims**



1. An apparatus for use in removing oil from the surface of a body of water contaminated with oil comprising:

a. a barrier comprising a boom with a front face, a rear face and a buoyant upper edge region, a spreader bar extending along the front face of the boom and serving to support opposed ends of the boom, and a water-pervious skirt having opposed upper and lower edges, the said upper edge being secured to said buoyant upper edge region and the said lower edge being secured to said spreader bar;

b. oil removal apparatus secured to the spreader bar for removing oil from the surface of the water body in which the barrier is buoyant, in the region of the spreader bar; and

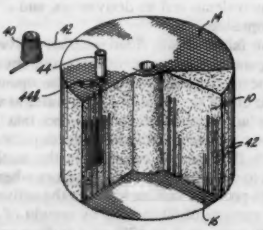
c. means for securing a movement of the barrier relative to the body of water in which the barrier is buoyant, thereby causing oil to accumulate ahead of the barrier for removal from the water body by the oil removal apparatus.

4,356,090

FLOW-THROUGH OIL/WATER SEPARATION FILTER

Nhan V. Tran, Bellevue, Wash., assignor to Marine Construction & Design Co., Seattle, Wash.

Filed Sep. 28, 1981, Ser. No. 305,994
Int. Cl.³ B01D *29/02*
U.S. Cl. 210—350 **5 Claims**



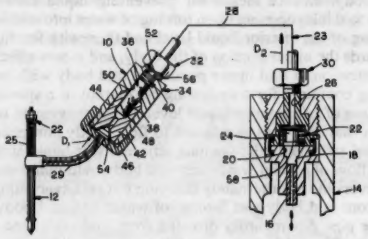
1. Repeatedly compressible and reexpandable flow-through filter means comprising a filter body of transversely monolithic retriculated synthetic foam material subject to compressive deformation under the forces of liquid flow, and holder means for positioning said filter body in a liquid flow path and for reinforcing said body against such compressive deformation, said holder means including flow-traversable, fixed upstream support means and fixed downstream support means respectively overlying and adjacent to the upstream and downstream faces of said body, a plurality of individual separate lengths of flexible cords fastened to said upstream support means at respective locations distributed in spaced relationship across said path and penetrating said filter body to a depth at least partly through the body substantially in the direction of liquid flow through said body, each of said elongated cord lengths being adhesively bonded to strands and nodes of said body contacted thereby substantially along the full length depth of penetration of said cord lengths in said body, thereby to reinforce said body against compressive deformation against said downstream support means under the forces of liquid flow acting on said body.

4,356,091

FILTERING AND DAMPENING APPARATUS

Albert B. Niles, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 6, 1980, Ser. No. 261,093
Int. Cl.³ B01D *35/02*
U.S. Cl. 210—354 **6 Claims**



1. Apparatus (10) for filtering fluid and dempening pressure of said fluid, comprising:

first and second fluid lines (28,29);

a housing (34) having a bore (50) and an opening (44) communicating with said bore (50), said bore (50) being in fluid communication with said first fluid line (28) at one end of said bore (50);

a retainer (42) having a bore (48) and being removably positioned in said opening (44), said bore (48) being positioned in fluid communication with said second fluid line (29) and with said bore (50) of said housing (34);

a connector element (46) adjustably positioned on said housing (34) to maintain said retainer (42) in position; and

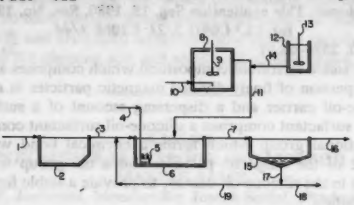
a filtering element (36) having a preselected filtering porosity and being positioned in said bores (50,48) of said housing (34) and retainer (42) to filter the fluid passing through said first fluid line (28) to said second fluid line (29) and controllably movable in said bores (50,48) in response to a pressure wave in the fluid traveling in said second fluid line (29) toward said first fluid line (28) striking said filtering element (36) to dampen said pressure wave.

4,356,092

METHOD FOR TREATING WASTE WATER

Norio Shimizu; Yoji Odawara, both of Hitachi, and Yasunori Masaki, Yamaguchi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 46,236, Jun. 7, 1979, abandoned. This application Aug. 31, 1981, Ser. No. 298,263
Claims priority, application Japan, Sep. 22, 1978, 53/115813
Int. Cl.³ C02F 3/34
U.S. Cl. 210—611 9 Claims



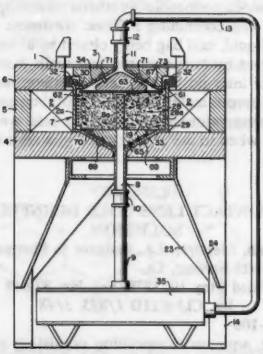
1. A process of treating waste water containing activated sludge and organic material comprising: culturing *Alcaligenes faecalis* HRL-1 (ATCC 31529) to produce cultured cells of *Alcaligenes faecalis* (HRL-1), adding the cultured cells to the waste water containing activated sludge and organic material, and subjecting the organic material in the waste water to the oxidizing and decomposing action of the cultured cells of *Alcaligenes faecalis* HRL-1 and the activated sludge, thereby treating the waste water.

4,356,093

METHOD OF INCREASING THE EFFECTIVENESS OF OR THE EFFECTIVE PRODUCTION RATE OF A PROCESS BY INTEGRATED FEED

William F. Abercrombie, Jr., Macon; Joey G. Colwell, Jr., Thomson, and Charles R. Price, Macon, all of Ga., assignors to J. M. Huber Corporation, Locust, N.J.

Filed Jan. 30, 1981, Ser. No. 230,153
Int. Cl.³ B01D 35/06
U.S. Cl. 210—695 4 Claims



4. In a method for increasing the production or brightness of a product produced by magnetic separation in a process wherein a fluid is passed over or through a column containing a matrix, or array of elements to remove magnetically susceptible minute particles from the fluid, wherein the efficiency decreases as the matrix or elements become saturated or degenerate is effectiveness with time and/or the passage of fluid over or through said matrix or array of elements; the improvement comprising operating the method using an integrated feed cycle and comprising the following steps:

(a) passing said fluid into said column at an initial flow rate Q_1 until said column is full;

(b) reducing the flow rate to an initial feed rate Q_2 at T_1;

(c) decreasing said flow rate over a time period of from T_1 to T_2 to a final feed rate Q_3 and maintaining the feed rate Q_3 to the end of the feed cycle time at T_3;

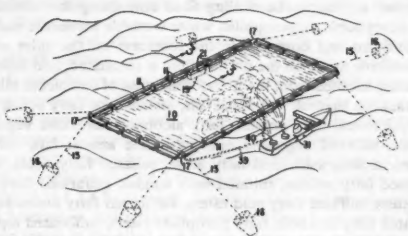
wherein Q_1 is the initial flow rate, Q_2 is the initial feed rate, and Q_3 is the final feed rate, T_1 is the time until the initial feed rate begins, T_2 is the time until the feed rate decreases, and T_3 is the time at the end of the feed cycle; and wherein Q_1 is not more than three times Q_3, and Q_3 is lower than Q_2, and wherein the process is conducted over a period of time such that the integration of the flow rate with respect to time yields a volume of product greater than or equal to the volume which would be produced at a constant flow rate for such product.

4,356,094

METHOD AND APPARATUS FOR CONTROLLING WATER SURFACE ACTIVITY

Sigmund L. Ross, Brooklyn, N.Y., assignor to David K. Shuffman, New York, N.Y.

Continuation of Ser. No. 849,201, Nov. 9, 1977, abandoned. This application Mar. 12, 1979, Ser. No. 19,564
Int. Cl.³ B01D 17/00; E02B 3/00
U.S. Cl. 210—774 12 Claims



1. A method of reducing the surface activity of a body of water which comprises at least partially surrounding a body of water by a succession of booms so that the surface of said body of water is substantially isolated by the presence of said booms in relation to the surface of water peripherally external with respect to said booms and cascading ice particles onto said body of water in sufficient quantity to substantially reduce the surface activity of said body of water.

12. Apparatus for influencing the surface activity of a body of water responsive to contacting said surface water a material at a cryothermal temperature which comprises a succession of elongated buoyant booms which are endwise interconnected and each of which presents a surface for contact with the water surface and has elongated passage means comprised therein disposed for maintaining said surface of said boom in thermally conductive relation with fluid within said passage, means for providing fluid at a cryothermal temperature, means for directing said fluid at a cryothermal temperature from said last mentioned means to said passage in one of said booms, and a flexible hose means for directing said fluid at a cryothermal temperature from said last mentioned passage to the elongated passage comprised in an adjoining boom.

4,356,095

WATER-SOLUBLE POLYMERS AND UTILIZATION THEREOF

Richard I. Leavitt, Baton Rouge, La., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 861,818, Dec. 19, 1977, abandoned, which is a division of Ser. No. 696,091, Jun. 14, 1976, Pat. No. 4,072,606, which is a division of Ser. No. 418,489, Nov. 23, 1973, Pat. No. 3,989,592. This application Jan. 8, 1981, Ser. No. 223,463

Int. Cl.³ E21B *43/22*

U.S. Cl. 252—8.55 D 5 Claims

1. In a process for recovering oil from oil wells which comprises injecting a slug of polymer solution into a subterranean oil-bearing formation to displace oil from said formation, the improvement comprising: injecting a slug of aqueous solution having a pH greater than about 9, containing as a viscosity increasing agent up to about 2% concentration of water-soluble polymers, said polymers being produced by contacting under conversion conditions, water-dispersible proteins with enzymes elaborated by the microorganism *Pseudomonas fabricans* No. 492 (A.T.C.C. No. 21984), which polymers are characterized in that solutions thereof reversibly increase in viscosity on raising the pH to a value greater than about 9.

4,356,096

METHOD OF ENHANCING THE EFFECT OF LIQUID ORGANIC LUBRICANTS IN DRILLING FLUIDS

Jack C. Cowan, Lafayette, La.; Tommy Thrash, Littlefield, Tex., and Jerry R. Rayborn, New Orleans, La., assignors to Venture Chemicals, Inc., Lafayette, La.

Filed Jun. 1, 1981, Ser. No. 269,430

Int. Cl.³ C09K *7/02*

U.S. Cl. 252—8.5 C 7 Claims

1. A method of increasing the effectiveness of a liquid organic lubricant in a water base well drilling fluid which comprises adding to the drilling fluid containing the lubricant a hydrophobic, organophilic, water wettable sorbent to sorb the lubricant and concentrate the lubricant on the sides of the borehole in which the drilling fluid is circulated, said lubricant being selected from the group consisting of petroleum oils and fractions thereof, vegetable oils, animal fats, fatty acids, fatty acid esters, fatty amides, fatty alcohols, sulfurized vegetable oils, sulfated vegetable oils, sulfurized animal fats, sulfated animal fats, sulfurized fatty acids, sulfated fatty acids, sulfurized fatty amides, sulfated fatty amides, sulfurized fatty acid esters, sulfated fatty acid esters, sulfurized fatty alcohols, sulfated fatty alcohols, fatty phosphate esters, sulfonated asphalts and asphaltenes, and mixtures thereof, and said sorbent being selected from the group consisting of cellulose fibers which have been surface treated to be hydrophobic and organophilic, peat, bagasse, and mixtures thereof, said sorbent having a particle size such that at least 95% by weight thereof present in a water suspension will pass through a 100 mesh screen.

4,356,097

ALKYLPHOSPHONATE LUBRICATING OIL

Andrew G. Papay, Manchester, Mo., assignor to Edwin Cooper, Inc., St. Louis, Mo.

Continuation-in-part of Ser. No. 891,591, Mar. 30, 1978, Pat. No. 4,158,633. This application Feb. 12, 1979, Ser. No. 11,141

The portion of the term of this patent subsequent to Jun. 19, 1996, has been disclaimed.

Int. Cl.³ C10M *1/48, 3/42*

U.S. Cl. 252—33.4 6 Claims

1. In a motor oil composition formulated for use as a crankcase lubricant for internal combustion engines, said formulated oil containing an ashless dispersant, the improvement comprising including in said composition an amount sufficient to reduce fuel consumption of said engine of a di-ethyl $C_{12\text{-}30}$ alkylphosphonate, said improvement functioning to reduce fuel consumption of an internal combustion engine when said motor oil composition is used as the crankcase lubricating oil in said engine.

4,356,098

STABLE FERROFLUID COMPOSITIONS AND METHOD OF MAKING SAME

Mark S. Chagnon, Lowell, Mass., assignor to Ferrofluidics Corporation, Nashua, N.H.

Continuation-in-part of Ser. No. 92,322, Nov. 8, 1979, abandoned. This application Sep. 15, 1980, Ser. No. 187,317

Int. Cl.³ C09D *5/23;* C10M *3/44*

U.S. Cl. 252—62.51 23 Claims

1. A stable ferrofluid composition which comprises a colloidal dispersion of finely-divided magnetic particles in a liquid silicone-oil carrier and a dispersing amount of a surfactant, which surfactant comprises a silicone-oil surfactant containing a functional group which forms a chemical bond with the surface of the magnetic particles and a tail group which is soluble in the silicone-oil carrier, to provide a stable ferrofluid composition.

4,356,099

FABRIC TREATMENT PRODUCTS

James F. Davies, Wirral, and John B. Tune, Higher Bebington, both of England, assignors to Lever Brothers Company, New York, N.Y.

Filed May 12, 1981, Ser. No. 262,845

Claims priority, application United Kingdom, May 16, 1980, 8016243

Int. Cl.³ D06M *13/00, 13/16;* B65D *33/16;* C11D *17/00*

U.S. Cl. 252—90 3 Claims

1. In a fabric treatment product for washing machine use in the form of a bag containing a fabric treatment composition, the improvement which comprises a bag formed of water-insoluble water-impermeable synthetic thermoplastic sheet material, said bag containing a fabric treatment composition comprising a liquid, said bag being closed by at least one weak heat seal formed by two opposed bag walls heat-sealed to a separator sheet inter-positioned between them, said separator sheet being of porous material which is not thermoplastic at the heat-sealing temperature used, whereby said weak heat seal will self-open when in use and agitated in a washing machine.

4,356,100

SOFT CONTACT LENS COLD DISINFECTANT SOLUTION

Guy J. Sherman, Metairie, La., assignor to Sherman Laboratories, Inc., Abita Springs, La.

Filed May 10, 1979, Ser. No. 37,645

Int. Cl.³ C11D *1/825, 3/48*

U.S. Cl. 252—106 8 Claims

1. A sterile, aqueous composition consisting essentially of water, from about 0.1% to about 8.6% by weight of said total aqueous composition of a polyoxypropylene-polyoxyethylene block copolymer having a molecular weight of about 1,100 to about 14,000, a water solubility in excess of about 10 grams per 100 milliliters, a cloud point in 1% aqueous solution above about 32° C. and a foam height in excess of about 32 millimeters, from about 0.05% to about 0.45% by weight of said total aqueous composition of an alkylphenoxy polyethoxy ethanol octylphenol that is a physiologically acceptable non-ionic surface acting agent having a water solubility in excess of about 1 milliliter per 100 milliliters, a cloud point in 1% aqueous solution of from about 65° C. to about 100° C. and a foam

height in excess of about 25 millimeters, from about 0.1% to about 10% ascorbic acid by weight of the total aqueous composition, from about 0.001% to about 0.006% Thimerosal by weight of the total aqueous composition, from about 0.2% to about 2.5% propylene glycol by weight of the total aqueous composition, a salt of ethylenediaminetetraacetic acid suitable for use as a preservative and buffer and present in an amount to maintain the pH of the aqueous composition in a range of between about 4.0 and 7.0, which composition disinfects soft and semi-hard contact lenses within four hours, is compatible with soft and semi-hard lenses to allow storage therein and is suitable for cleaning soft and semi-hard contact lenses.

4,356,101

IRON ACTIVE ELECTRODE AND METHOD OF MAKING SAME

John F. Jackovitz, Monroeville; Joseph Seidel, Pittsburgh, and Earl A. Pantier, Verona, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 16, 1981, Ser. No. 254,708

Int. Cl.³ H01M *4/52, 4/08*

U.S. Cl. 252—182.1 **26 Claims**

1. A method of preparing an electrode active material comprising calcining iron sulfate in an oxidizing atmosphere at a temperature in the range of from about 600° C. to about 850° C. for a time sufficient to produce an iron oxide with a trace amount of sulfate, and heating the iron oxide with the trace amount of sulfate in a reducing atmosphere at an elevated temperature to produce activated iron having a trace amount of sulfide.

4,356,102

DICHROIC LIQUID CRYSTAL COMPOSITIONS CONTAINING ANTHRAQUINONE-BASED DYES

Sigfried Aftergut, Schenectady, and Herbert S. Cole, Jr., Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 22, 1980, Ser. No. 199,589

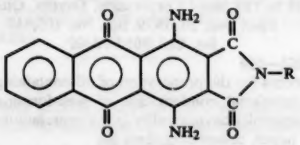
Int. Cl.³ C02F *1/13;* C09K *3/34*

U.S. Cl. 252—299.1 **7 Claims**

1. A liquid crystal composition comprising:

a host liquid crystal material; and

at least one guest anthraquinone dye dissolved in said host liquid crystal material, said anthraquinone dye having the general formula:



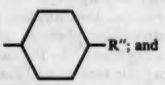
wherein R is selected from the group consisting of:

a cyclohexyl radical;

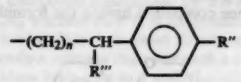
a phenyl radical;

a benzyl radical;

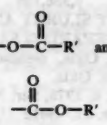
a substituted phenyl radical having the formula:



a substituted benzyl radical having the formula:



where R″ is in the para-position and is selected from the group consisting of halogen, cyano, nitro, alkoxy, hydroxyl, amino, alkylamino, dialkylamino, alkyl wherein the alkyl is from about 1 to about 10 carbon atoms, arylamino and esters having the formula:



wherein R′ is selected from the group consisting of alkyl, substituted alkyl, aryl and substituted aryl; R‴ is hydrogen or alkyl having from about 1 to about 3 carbon atoms; and n is an integer from 0 to 5.

4,356,103

LIQUID CRYSTALS FOR ELECTRO-OPTICAL DEVICES

Herrmann Schubert, Nehlitz; Gerhard Pelzl, Halle; Horst Zaschke, Halle; Dietrich Demus, Halle; Hans-Ulrich Nothni, Hoyerswerda, and Frank Kuschel, Halle, all of German Democratic Rep., assignors to Veb Werk für Fernsehelektronik, Berlin-Oberschöneweide, German Democratic Rep.

Continuation of Ser. No. 9,042, Feb. 2, 1979, abandoned. This application May 5, 1980, Ser. No. 147,254

Claims priority, application German Democratic Rep., Feb. 6, 1978, 203563

Int. Cl.³ G02F *1/13;* C09K *3/34*

U.S. Cl. 252—299.1 **7 Claims**

1. In an electro-optic display employing a smectic liquid crystal composition for modulation of transmitted or reflected light and rendering numerals, symbols, and images in color, the improvement wherein said liquid crystal composition comprises a compound selected from the group consisting of 3,6-bis-(4-n-alkylphenyl)-1,2,4,5-tetrazine, 4-n-alkyl-4′-n-alkoxy-3,6-diphenyl-1,2,4,5-tetrazine, 6-n-alkyl-3-(4-n-alkoxyphenyl)-1,2,4,5-tetrazine, and mixtures thereof, having from one to 12 carbon atoms in the alkyl and alkoxy chains, said composition employed as a planarly oriented, smectic C phase of positive dielectric anisotropy and possessing the properties of a dichroitic dyestuff.

4,356,104

4-SUBSTITUTED PHENYL 4-(5N-ALKYL-1,3-DIOXAN-2-YL)BENZOATES

Ying Y. Hsu, Los Altos, Calif., assignor to Timex Corporation, Waterbury, Conn.

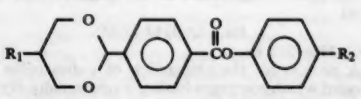
Division of Ser. No. 212,303, Dec. 3, 1980, Pat. No. 4,313,878. This application Jun. 29, 1981, Ser. No. 277,796

Int. Cl.³ G02F *1/13;* C09K *3/34*

U.S. Cl. 252—299.61 **8 Claims**

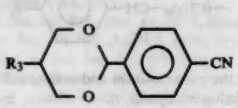
1. A nematic liquid crystal admixture for an electrooptic display wherein said mixture comprises:

(a) at least one compound selected from the group having the formula:



wherein R_1 is an alkyl group and R_2 is an alkyl, alkoxy, CN or NO_2; and

(b) at least one compound having the formula:



wherein R_3 is an alkyl or alkoxy group.

4,356,105
LOW VISCOSITY SLURRY AND METHOD OF PREPARING SAME

Yulin Wu, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 6, 1978, Ser. No. 894,068
Int. Cl.³ B01J *13/00*
U.S. Cl. 252—308 **15 Claims**

1. A method of preparing a relatively low viscosity slurry comprising:

(a) providing a material which forms a relatively high viscosity slurry of thin, flexible, plate-shaped individual crystals when a dilute aqueous solution thereof is mixed with a dispersant in which said material is insoluble and to which said material is inert and the water is at least partially evaporated therefrom;

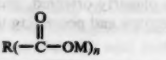
(b) forming a dilute aqueous solution of said material;

(c) at least partially evaporating the water from said dilute aqueous solution to form granular shaped aggregates of plate-shaped crystals of said material;

(d) recovering said granular shaped aggregates of plate-shaped crystals; and

(e) mixing directly with said dispersant said granular shaped aggregates of plate-shaped crystals of said material so that the thus produced slurry has a lower viscosity than a slurry comprising said dispersant and an equal weight percent of said material wherein said material is essentially in the form of individual plate-shaped crystals of about the same size as said aggregates.

9. A slurry having a relatively low viscosity comprising granular shaped aggregates of plate-shaped crystals, said aggregates having a water content of less than 30% by weight and being mixed with a dispersant in which said aggregates are insoluble and to which said aggregates are inert to produce said slurry, the material from which said aggregates are formed being represented by the formula



wherein R is an aromatic hydrocarbon radical having 6 to about 35 carbon atoms, M is selected from the group consisting of an alkali and an alkaline earth metal, and n is an integer selected from the group consisting of 1, 2, 3 and 4, wherein at least 90 weight percent of said material is in the form of said granular aggregates of plate-shaped crystals.

4,356,106
CERIUM COMPOUNDS

James L. Woodhead, Didcot, and Graham Raw, Abingdon, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Apr. 20, 1981, Ser. No. 255,818
Claims priority, application United Kingdom, May 9, 1980, 8015395
Int. Cl.³ B01J *13/00*
U.S. Cl. 252—313 R **14 Claims**

1. A process for the preparation of a dispersible cerium compound which comprises heating a substantially dry cerium (IV) oxide hydrate in the presence of a deaggregating agent to cause deaggregation of aggregated crystallites in the cerium (IV) oxide hydrate and produce a dry dispersible cerium compound.

7. A process as claimed in claim 1 further comprising the step of dispersing the dry dispersible cerium compound in an aqueous medium to give a colloidal dispersion of the cerium compound.

9. A process as claimed in claim 1 further comprising the steps of mixing the dispersible cerium compound with water at such a concentration that the dispersible cerium compound coagulates to form a slurry and separating the coagulated cerium compound from liquor of the slurry.

12. A dry dispersible cerium compound prepared by a process as claimed in claim 1.

4,356,107
PROCESS FOR PREPARING SILICA SOLS

Charles C. Payne, Chicago, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Division of Ser. No. 97,510, Nov. 26, 1979, abandoned. This application Jul. 18, 1980, Ser. No. 170,030
Int. Cl.³ B01J *13/00*; C01B *33/14*
U.S. Cl. 252—313 S **9 Claims**

1. A process of preparing larger particle sized silica sols with narrow particle distribution and enhanced surface density as compared to the surface density of silica sol particles in a silica sol starting material which consists essentially in heating a broad distribution aqueous silica sol containing larger silica particles of which at least 50% in number have a particle size of at least 40 millimicrons, the remainder of the silica particles being smaller and of different sizes, under superatmospheric pressure, at a temperature of 138° C. to 240° C. and a starting alkaline pH within the range of 8–10.5 sufficient to permit growth of particle size without completely dissolving the silica particles for a period of time sufficient to increase the number and size of the larger sized particles and to increase the surface density of the resultant larger sized particles while reducing the number of smaller sized particles, the temperature, pH and time of heating being sufficient to produce an aqueous silica sol in which the number of larger silica particles having a particle size of at least 40 millimicrons is at least as great as in the starting sol, the weight average of said larger silica particles is greater than that of the larger silica particles in the starting sol, the number of smaller particles is less than the number of smaller particles in the starting sol, and the resultant sol contains fewer particles of different sizes than the starting sol.

4,356,108
ENCAPSULATION PROCESS

Gerhart Schwab, and Gerald T. Davis, both of Chillicothe, Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Dec. 20, 1979, Ser. No. 105,445
Int. Cl.³ B01J *13/02*
U.S. Cl. 252—316 **11 Claims**

1. A process for the preparation of oil-containing microcapsules by interfacial condensation of wall-forming materials, said microcapsules having utility in the manufacture of carbonless copy paper, comprising steps of:

(a) forming a hydrophilic phase comprising water, a water soluble emulsifying agent and a water soluble polyfunctional amine salt, said polyfunctional amine salt being the reaction product of a polyfunctional amine and an acid;

(b) forming a hydrophobic phase comprising an oil and an oil soluble polyfunctional wall-forming material, said oil containing a chromogenic material;

(c) mixing together said hydrophobic and said hydrophilic phases with agitation, thus forming an emulsion of droplets of said hydrophobic phase in said hydrophilic phase, said droplets being from 3 to 10 microns in diameter;

(d) adding an inorganic base to said emulsion, said inorganic base being addd in an amount sufficient to convert said polyfunctional amine salt to a polyfunctional amine, and

to neutralize acids formed during subsequent condensation reactions, said polyfunctional amine being coreactive with said oil soluble polyfunctional wall-forming material, the pH of said resulting emulsion being slightly alkaline;

(e) stirring the resulting emulsion for a period of time sufficient to allow said polyfunctional amine and said oil soluble polyfunctional wall-forming material to react to form microcapsule walls around said droplets of hydrophobic phase, said microcapsule walls being substantially impermeable to said hydrophilic and said hydrophobic phases.

4,356,109

METHOD FOR PREPARING MICROCAPSULES

Keiso Saeki; Hiroharu Matsukawa, and Masato Satomura, all of Fujinomiya, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 926,369, Jul. 20, 1978, Pat. No. 4,251,386. This application Feb. 7, 1980, Ser. No. 119,599

Claims priority, application Japan, Jul. 27, 1977, 52-90148

The portion of the term of this patent subsequent to Feb. 17, 1998, has been disclaimed.

Int. Cl.³ B01J *13/02*

U.S. Cl. 252—316 **15 Claims**

1. A method for preparing microcapsules comprising polymerizing urea and formaldehyde in an aqueous solution in the presence of an anionic polyelectrolyte and an ammonium salt of an acid and forming a wall membrane of a urea/formaldehyde resin around droplets of a hydrophobic oily liquid, wherein the amount of polyelectrolyte is about 0.5 to 15% by weight based on the weight of the aqueous solution and the ammonium salt is used in an amount of about 1 to 200% by weight, based on the weight of the urea.

4,356,110

SECONDARY STABILIZER

Bengt A. L. Sallmen; Carl-Axel E. Sjögreen, both of Perstorp; Mans O. Mansson, Helsingborg, and Keith F. R. Ogemark, Perstorp, all of Sweden, assignors to Perstorp AB, Perstorp, Sweden

Filed Oct. 30, 1978, Ser. No. 955,585

Claims priority, application Sweden, Nov. 29, 1977, 77134682

Int. Cl.³ C09K *15/06*

U.S. Cl. 252—407 **5 Claims**

1. A secondary stabilizer for vinyl chloride polymers comprising particles of a mixture of pentaerythritol and a second organic compound having at least two hydroxyl groups dispersed in a liquid carrier in which the said mixture has been ground, said particles having been prepared by melting together the pentaerythritol and said second organic compound having at least two hydroxyl groups, solidifying the resulting molten mixture, and grinding the resulting solid white mixed with said liquid carrier to form a dispersion of solid particles in the liquid carrier.

4,356,111

HIGH EFFICIENCY CATALYST CONTAINING TITANIUM AND ZIRCONIUM FOR POLYMERIZING OLEFINS

Randall S. Shipley, Alvin, and Kirby Lowery, Jr., Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 20, 1980, Ser. No. 198,681

Int. Cl.³ C08F *4/64*

U.S. Cl. 252—429 B **14 Claims**

1. A catalytic reaction product of

(A) a trivalent or tetravalent titanium compound represented by the empirical formulas (i) $TiX_n(OR)_{4-n}$ wherein X is a halogen, R is a hydrocarbyl group having from 1 to about 20 carbon atoms and n has a value of zero to 4; (ii) α- and/or γ-$TiCl_3$; and (iii) $TiZ_3(L)_x$ wherein Z is a halogen and L is an electron donating compound selected from water, ketones, ethers, amines or olefins and x is a whole number from 1 to 6;

(B) a zirconium compound represented by the empirical formula $Zr(OR)_xX_y$ wherein each R is independently a hydrocarbyl group having from 1 to about 20 carbon atoms; each X is independently a halogen atom and each x and y independently have values from zero to 4 with the value of x plus y being 4;

(C) an organomagnesium component selected from

(1) an organomagnesium compound or

(2) a complex of an organomagnesium compound and an organometallic compound in an amount sufficient to solubilize the organomagnesium compound in a hydrocarbon solvent; said organomagnesium component being represented by the empircal formula $MgR''_{2-x}MR''_y$ wherein M is aluminum, zinc, boron, silicon, tin or phosphorus; each R'' is independently hydrocarbyl or hydrocarbyloxy having from 1 to about 20 carbon atoms; x has a value from zero to about 10 and y has a value corresponding to the valence of M;

(D) a halide source selected from

(1) an active non-metalic halide, said non-metallic halide corresponding to the empirical formula R'X wherein R' is hydrogen or an organic group at least as active as sec-butyl and X is halogen; or

(2) a metallic halide corresponding to the empirical formula $MR_{y-a}X_a$ wherein M is a metal of Group IIIA or IVA of Mendeleev's Periodic Table of the Elements, R is a hydrocarbyl or hydrocarbyloxy group, X is halogen, y is a number corresponding to valence of M and a is a number from 1 to y;

provided that the proportions of the foregoing components of said catalytic reaction product are such that the atomic ratio of Mg:Zr is from about 1:1 to about 100:1; the atomic ratio of Al:Zr is from about 0.1:1 to about 100:1; the atomic ratio of Zr:Ti is from about 0.5:1 to about 50:1; the atomic ratio of excess X:Al is from about 0.0005:1 to about 10:1; and further provided that when the organomagnesium component and/or the halide source provides insufficient quantities of aluminum, there is also present

(E) an aluminum compound represented by the empirical formula $AlR_{y'}X_{y''}$ wherein R and X are as defined above and y' and y'' each have a value of from zero to three with the total value of y' plus y'' being three;

and wherein the components are added in an order selected from the group consisting of:

(a) (i) component (C), (ii) component (D), (iii) component (E), if employed, followed by (iv) components (A) and (B) in any order or as a mixture;

(b) (i) component (D) if it contains aluminum, (ii) component (C), (iii) components (A) and (B) in any order or as a mixture; and

(c) (i) component (D) if aluminum is present, (ii) components (A) and (B) in any order or as a mixture and (iii) component (C).

4,356,112

CATALYST FOR PRODUCTION OF PHTHALIC ANHYDRIDE

Yoshiyuki Nakanishi; Yoji Akazawa; Noriaki Ikeda, all of Himeji, and Takehiko Suzuki, Ohtsu, all of Japan, assignors to Nippon Shukubai Kagaku Kogyo Co. Ltd., Osaka, Japan

Filed Nov. 26, 1980, Ser. No. 210,689

Claims priority, application Japan, Dec. 3, 1979, 54-155608

Int. Cl.³ B01J *27/14*

U.S. Cl. 252—435 **5 Claims**

1. A catalyst for the production of phthalic anhydride by the catalytic vapor-phase oxidation of o-xylene or naphthalene with molecular oxygen, said catalyst comprising a catalytically active material composed of 1 to 20 parts by weight as V_2O_5 of vanadium oxide and 99 to 80 parts by weight as TiO_2 of anatase-type titanium oxide being porous and having a particle diameter substantially of 0.4 to 0.7 micron and a specific sur-

face area of 10 to 60 m^2/g, and per 100 parts by weight of the sum of these two components, 0.01 to 1 part by weight as Nb_2O_5 of niobium, 0.05 to 1.2 parts by weight as oxide of potassium, cesium, rubidium or thallium, 0.2 to 1.2 parts by weight as P_2O_5 of phosphorus and 0.5 to 10 parts by weight as Sb_2O_3 of antimony, said catalytically active material being supported on a porous carrier in an amount of 3 to 200 g/100 cc of carrier.

4,356,113

SUBSTRATES WITH CALIBRATED PORE SIZE AND CATALYSTS EMPLOYING THE SAME

John Lim, Anaheim; Michael Brady, Studio City, and Kirk Novak, Fullerton, all of Calif., assignors to Filtrol Corporation, Los Angeles, Calif.

Filed Nov. 17, 1980, Ser. No. 207,142
Int. Cl.[3] B01J *29/06, 35/00*
U.S. Cl. 252—455 Z 8 Claims

1. In the process of increasing the pore volume of an alumina-containing calcined catalyst support by incorporating combustible solid particles in the support prior to calcination and calcining the support containing the combustible particles, the improvement which comprises determining the average pore-size distribution and the pore volume of an alumina-containing particulate support prior to incorporating combustible particles, preparing an acidified, aqueous dispersion of carbon black particles, the particles having a preselected particle-size distribution, as determined by measuring the average particle diameter of the carbon black, in order to amplify only those pores of the alumina-containing support which have smaller diameters than those of the carbon black particles, admixing the aqueous dispersion with the particulate support, drying the mixture and calcining the dried mixture at a temperature sufficient to combust the carbon black particles and recovering a support having increased pore volume in the preselected pore-size range.

4. The process of claim 1, wherein the support is a mixture of a zeolite, pseudoboehmitic alumina and clay.

7. The process of claim 1 wherein the aqueous dispersion of the carbon black particles is acidified with an acid selected from nitric and formic acids.

4,356,114

PROCESS FOR PRODUCING COMPOSITE OXIDE CATALYSTS

Koju Kadowaki; Kohei Sarumaru, and Yoshiaki Tanaka, all of Ami, Japan, assignors to Mitsubishi Petrochemical Company Limited, Japan

Filed May 11, 1981, Ser. No. 262,137
Claims priority, application Japan, May 19, 1980, 55/66295
Int. Cl.[3] B01J *23/20, 23/22, 23/28*
U.S. Cl. 252—467 4 Claims

1. In a process for producing a composite oxide catalyst comprising at least molybdenum together with vanadium and/or niobium, which process includes a step of thermal decomposition of a catalyst precursor comprising a mixture of compounds and/or a complex compound of the source of constituent elements, the improvement in which the thermal decomposition step is carried out under the conditions that:

(1) the catalyst precursor is heated in a vessel of a heat-exchanger structure wherein a first space accommodating the catalyst precursor and a second space through which a fluid for heating flows are partitioned from each other by a partitioning structure and thereby separated, and, moreover, heating of the catalyst precursor is accomplished through the partitioning structure;

(2) the thermal decomposition step is carried out as an atmosphere gas in which oxygen concentration has been adjusted to a value within a range of 0.05 to 5 percent is caused to flow through said first space; and

(3) the maximum temperature reached in the thermal decomposition step is in a range of 300° to 550° C.

4,356,115

FRAGRANT SYNTHETIC RESIN PRODUCT AND METHOD OF PRODUCING THE SAME

Ichiro Shibansi; Kouki Horikoshi, both of Tokyo, and Nobuyuki Nakamura, Kunitachi, all of Japan

Filed Apr. 27, 1981, Ser. No. 267,969
Int. Cl.[3] A61K *7/46*
U.S. Cl. 252—522 A 4 Claims

1. A fragrant synthetic resin product comprising a cyclodextrin and a perfume material which are physically mixed to form a dry-pulverized cyclodextrin inclusion compound containing said perfume material, and a thermoplastic synthetic resin material which is physically mixed with said dry-pulverized cyclodextrin inclusion compound to form a molding mixture, said molding mixture being molded to form said product.

4,356,116

DEVOLATILIZED ROOM TEMPERATURE VULCANIZABLE SILICONE RUBBER COMPOSITION

Melvin D. Beers, Schenectady, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Apr. 3, 1981, Ser. No. 250,800
Int. Cl.[3] C08L *33/06;* C08G *77/34*
U.S. Cl. 524—837 47 Claims

1. A devolatilized room temperature vulcanizable silicone rubber composition wherein the volatiles content does not exceed 0.003 gm/c.c. of silica comprising (A) 100 parts by weight of devolatilized diorganosilanol chainstopped linear diorganopolysiloxane base polymer having a viscosity varying from 100 to 1,000,000 centipoise at 25° C. where the organo group is a monovalent hydrocarbon radical and wherein the base polymer is devolatilized by heating at temperatures above 220° C. under vacuum for at least 2 minutes; (B) from 3 to 30 parts by weight of a devolatilized plasticizing fluid having from 3 to 60 mole percent of monoorganosiloxy units of the formula,

$$RSiO_{1.5}$$

34 to 96 mole percent of diorganosiloxy units of the formula,

$$R_2SiO$$

and 1 to 6 mole percent of triorganosiloxy units of the formula,

$$R_3SiO_{0.5}$$

which fluid contains from 0.1 to 2.0% by weight of hydroxyl group and where R is a monovalent hydrocarbon radical wherein the plasticizing fluid is devolatilized by heating the fluid at a temperature of at least 260° C. under vacuum for at least 5 minutes; (C) from 0.1 to 15 parts by weight of a cross-linking agent; and (D) from 0.01 to 10 parts by weight of a catalytic promoter.

4,356,117

CHEMICAL MODIFICATIONS OF PROTEINS WHICH INDUCE NEW RECEPTOR SPECIFICITIES AND THEREFORE ELICIT NEW EFFECTS IN CELLS

David M. Neville, Jr., Bethesda; Richard J. Youle, Kensington, and Gary J. Murray, Bethesda, all of Md., assignors to U.S. Govt., Dept. of Health & Human Services, Washington, D.C.

Filed Oct. 23, 1980, Ser. No. 199,781
Int. Cl.[3] C07G *7/00*
U.S. Cl. 260—112 R 1 Claim

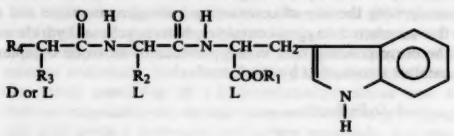
1. A cell type specific cytotoxic reagent composition consisting of mannose-6-phosphate-Modeccin, a hybrid prepared from Modeccin.

4,356,118
TRYPTOPHAN DERIVATIVES

William H. Owens, Arlington Heights, Ill., assignor to G. D. Searle & Co., Skokie, Ill.

Filed Jun. 2, 1981, Ser. No. 269,202
Int. Cl.³ C07C *103/52*
U.S. Cl. 260—112.5 R 14 Claims

1. A compound according to formula I:



wherein R_1 is:
(a) hydrogen;
wherein R_2 is:
(a) hydrogen;
(b) iso-propyl; or
(c) tert-butyl;
wherein R_3 is:
(a) methyl; or
(b) —NHR_5;
whereing R_5 is:
(a) hydrogen or
(b) aroyl;
wherein R_4 is:
(a) CH_2SP;
(b) iso-propyl;
(c) iso-butyl;
(d) imidazolmethyl;
(e) phenylmethyl; or
(f) methylthioethyl;

4,356,119
THERAPEUTICALLY ACTIVE POLYPEPTIDES OR ACID ADDITION SALTS AND A PROCESS FOR PRODUCING SUCH COMPOUNDS

Hans Kofod, Lyngby, Denmark, assignor to Nordisk Insulinlaboratorium, Gentofte, Denmark

Filed Sep. 24, 1979, Ser. No. 78,424
Claims priority, application Denmark, Sep. 28, 1978, 4304/78
Int. Cl.³ C07C *103/52;* A61K *37/00*
U.S. Cl. 260—112.5 R 2 Claims

1. A polypeptide derivative of the general formula:

a—x—b—arg—c

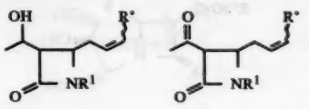
wherein x represents glu or asp,
a represents hydrogen or a small protective group for the α-amino group in x,
b represents leu, a di- or tripeptide selected from the group consisting of leu-ser, ser-ala, his-phe, and gly-gly-gly, or when x is glu, b may also represent a bond or a secretin fragment selected from the group consisting of leu-ser-arg-leu and leu-ser-arg-leu-arg-asp-ser-ala, or when x is asp, b may also represent the secretin fragment ser-ala-arg-leu-gln, c represents —NR^1R^2, wherein R^1 and R^2 are selected from the group consisting of hydrogen and C_1–C_6 alkyl or c represents —OR^3, wherein R^3 is selected from the group consisting of hydrogen and C_1–C_6 alkyl, except that when x is asp and b is ser-ala R^3 is not hydrogen, or acid addition salts of such peptides with acids acceptable to the organism.

4,356,120
3-(1-HYDROXYETHYL)-4-(BUT-2-ENE)-AZETIDIN-2-ONE AND DERIVATIVES

Burton G. Christensen, Scotch Plains; Ronald W. Ratcliffe, Matawan, and Thomas N. Salzmann, North Plainfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 59,843, Jul. 23, 1979, abandoned. This application Jan. 5, 1981, Ser. No. 222,805
The portion of the term of this patent subsequent to Jun. 16, 1998, has been disclaimed.
Int. Cl.³ C07D *205/08, 487/04*
U.S. Cl. 260—239 A 1 Claim

1. A compound selected from the group consisting of:



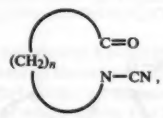
wherein R^1 is hydrogen or a readily removable protecting group selected from: t-butyldimethylsilyl, t-butyldiphenylsilyl, triphenylsilyl, isopropyldimethylsilyl, and 3,4-dimethoxybenzyl; and R° is alkyl having 1–6 carbon atoms, cycloalkyl having 3–6 carbon atoms, cycloalkylalkyl having 4–12 carbon atoms, and phenylalkyl having 7–12 carbon atoms.

4,356,121
PROCESS FOR THE PRODUCTION OF N-CYANOLACTAMS

Dieter Trachsler, Kaiseraugst, and Friedrich Lohse, Oberwill, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

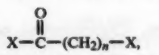
Filed Sep. 25, 1981, Ser. No. 305,662
Claims priority, application Switzerland, Oct. 7, 1980, 7480/80
Int. Cl.³ C07D *223/10*
U.S. Cl. 260—239.3 R 7 Claims

1. A process for the production of a N-cyanolactam of the formula



(I)

wherein n is an integer from 3 to 5 and the methylene carbon atoms are unsubstituted or substituted by one or two methyl or ethyl groups, or two adjacent methylene carbon atoms form part of a C_5–C_8 cycloaliphatic ring or a benzene ring, which process comprises reacting a compound of the formula II



(II)

wherein n is an integer from 3 to 5, the methylene carbon atoms are unsubstituted or substituted by one or two methyl or ethyl groups, or two adjacent methylene carbon atoms form part of a C_5–C_8 cycloaliphatic ring or a benzene ring, and each of the symbols X independently is a halogen atom, in the presence of an inorganic hydrogen halide acceptor, with cyanamide or a salt thereof.

2. A process according to claim 1, wherein there is used a compound of the formula II which contains no substituents or rings.

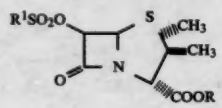
4,356,122

6-PERHALOALKYLSULFONYLOXY-PENICILLANIC ACIDS AND DERIVATIVES THEREOF

John E. G. Kemp, Canterbury, England, assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 147,438, May 7, 1980, abandoned. This application Dec. 10, 1980, Ser. No. 214,846
Claims priority, application United Kingdom, May 19, 1979, 7917505
Int. Cl.³ C07D *499/00*
U.S. Cl. 260—245.2 R 6 Claims

1. A compound having the formula



wherein R is H, a conventional penicillin carboxy protecting group or an ester forming residue readily hydrolyzable in vivo, and R^1 is a perfluoroalkyl or perchloroalkyl group having from 1 to 4 carbon atoms.

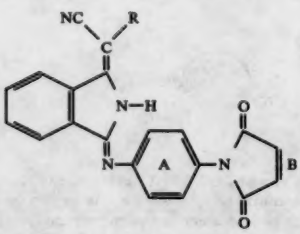
4,356,123

SPARINGLY SOLUBLE ISOINODOLINE COLORANTS

Wolfgang Lotsch, Beindersheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 7, 1980, Ser. No. 128,153
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1979, 2909645
Int. Cl.³ C07D *403/12;* C09B *57/04;* C07D *209/44;* C08K *5/34*
U.S. Cl. 260—326 N 9 Claims

1. A sparingly soluble isoindoline colorant of the formula:



wherein

R is carbamyl, N-C_1–C_4-alkylcarbamyl or N-phenylcarbamyl;

B is a 1,2-phenylene, 1,2-naphthylene or 2,3-naphthylene; and

A, B and the phenyl radical in R independently of one another are unsubstituted or substituted by groups which do not confer solubility to the isoindoline colorant and are selected from the group consisting of halogen, C_1–C_6-alkyl, C_1–C_6 alkoxy, nitro, trifluoromethyl, carbamyl, ureido, sulfamyl, cyano, C_1–C_5 alkoxycarbonyl, C_1–C_5 alkanoyl, C_1–C_5 alkylcarbamyl, C_1–C_5 alkylureido, C_1–C_5 alkanoylamino, C_1–C_6 alkylsulfonyl, C_1–C_6 alkylsulfamyl, aryloxycarbonyl, aroyl, aroylamino, arylsulfonyl, arylcarbamyl, arylsulfamyl, aryl, arylureido and arylazo.

4,356,124

PROCESS FOR THE PRODUCTION OF PYRROLIDONES

Frederick A. Pesa, Aurora, and Anne M. Graham, Northfield, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Oct. 5, 1979, Ser. No. 82,192
Int. Cl.³ C07D *207/38, 207/40*
U.S. Cl. 260—326.5 FN 17 Claims

1. A process for producing a five-membered saturated action comprising the step of contracting hydrogen, an amine and a five-membered oxygen-containing heterocyclic anhydride or the corresponding acid in the presence of an oxide complex catalyst represented by the formula:

$$A_aD_bFe_cRu_dO_x$$

wherein

A is cobalt, nickel, or mixtures thereof; and

D is selected from the group consisting of Rh, Pd, Os, Ir, Pt, and Zn; and

wherein

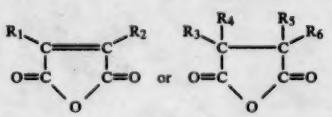
a, b and c are each independently 0 to 1; with the proviso that a and c are not both equal to 0;

d is 0.01 to 1; and

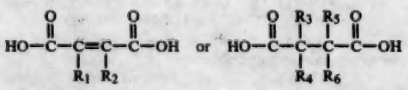
x represents the number of oxygens required to satisfy the valence requirements of the other elements present in the catalyst;

wherein the heterocyclic anhydride or corresponding acid is represented by the formulas:

Anhydrides



Corresponding Acids



wherein R_1, R_2, R_3, R_4, R_5 and R_6 are each independently selected from the group consisting of:

(1) hydrogen;

(2) C_{1-4} alkyls

and wherein ammonia or amine is represented by the following formula:

wherein R_7 is selected from the group consisting of:

(1) hydrogen;

(2) C_{1-4} alkyl;

(3) aryl; and

(4) $-(CH_2)_q-OH$, wherein q is 1 to 4.

4,356,125

PREPARATION OF 2-HYDROXYTETRAHYDROFURAN

Nicolaas A. de Munck, Delft, and Joseph J. F. Scholten, Sittard, both of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Filed Apr. 22, 1981, Ser. No. 256,671

Claims priority, application Netherlands, Apr. 23, 1980, 8002342

Int. Cl.³ C07C *45/50;* C07D *307/20*

U.S. Cl. 549—475 8 Claims

1. An improved process for the conversion of allyl alcohol with hydrogen and carbon monoxide in the presence of a catalytically active metallo-organic complex to form a reaction mixture containing hydroformylation product selected from the group consisting of 2-hydroxytetrahydrofuran and 4-hydroxybutyraldehyde, the improvement comprising bringing said allyl alcohol, hydrogen, and carbon monoxide, in a gaseous phase and at a temperature of between about 90° C. and 150° C., into contact with a catalyst comprised of a solid porous carrier material containing within its pores a solution of a catalytically active metallo-organic complex in at least one ligand-forming compound, said solution having a vapor pressure of less than 1.3 mbar under the reaction conditions applied.

4,356,126

CARBONYLATION OF ALKANOLS AND/OR ALIPHATIC ETHERS

Eit Drent, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 17, 1981, Ser. No. 274,616

Claims priority, application United Kingdom, Jun. 19, 1980, 8020045

Int. Cl.³ C07C *51/12, 67/36, 67/37;* C07D *307/60*

U.S. Cl. 260—410.9 R 20 Claims

1. A process for the carbonylation of alkanols and/or aliphatic ethers at a temperature of about 100° C.–225° C. and a pressure of about 20–100 bar in the presence of a Group VIII metal compound and pentachlorobenzenethiol and/or salts thereof, which comprises reacting the alkanols or aliphatic ethers with carbon monoxide using a pentachlorobenzenethiol compound: Group VIII metal compound molar ratio of not more than about 10.

4,356,127

PREPARATION OF 3-(2,2-DICHLORO-VINYL)-2,2-DIMETHYL-CYCLOPROPANE-1-CARBOXYLIC ACID DERIVATIVES

Hellmut Hoffmann, Wuppertal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

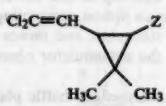
Filed Jul. 2, 1980, Ser. No. 165,928

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1979, 2929670

Int. Cl.³ C07C *120/00, 121/48, 69/743, 69/747*

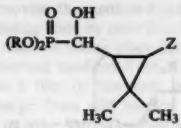
U.S. Cl. 260—464 6 Claims

1. A process for the preparation of a 3-(2,2-dichlorovinyl)-2,2-dimethyl-cyclopropane-1-carboxylic acid derivative of the formula



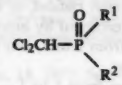
in which

Z is acetyl, cyano, carbamoyl or C_{1-4}-alkoxycarbonyl, comprising reacting an α-hydroxy-phosphonic acid ester of the formula



in which

R each independently is C_{1-4}-alkyl or phenyl, or the two radicals R together are 2,2-dimethyl-propane-1,3-diyl, with a dichloromethane derivative of the formula



in which

R^1 and R^2 each independently is C_{1-4}-alkyl, phenyl, C_{1-4}-alkoxy or phenoxy, or together are C_{2-5}-alkane-dioxy, at a temperature between about −100° and +100° C. in a reaction phase consisting essentially of an inert aprotic organic liquid and in the presence of a base selected from the group consisting of an alkali metal hydroxide, an alkali metal alcoholate, an alkali metal hydride, an alkali metal amide, an alkyl-lithium compound or an amine.

4,356,128

FATTY POLYHYDRIC ALCOHOLS HAVING A POLAR FUNCTIONAL GROUP

Edgar Rogier, Minnetonka, Minn., assignor to Henkel Corporation, Minneapolis, Minn.

Filed Apr. 27, 1981, Ser. No. 257,674

Int. Cl.³ C07C *121/34*

U.S. Cl. 260—465.6 9 Claims

1. Polyhydroxymethyl compounds containing a polar group which have the formula:

$$CH_3(CH_2)_m[C(CH_2OH)X]_n(CH_2)_p[C(CH_2OH)X]_q(CH_2)_r[C(CH_2OH)X]_s(CH_2)_tCH_2M$$

and mixtures thereof wherein X is either hydrogen or hydroxymethyl but not mixtures thereof provided that there are at least two hydroxymethyl groups per molecule; n plus q plus s are integers the sum of which is from 1 to 3; n, q and s are 0 or 1; m through t are integers the sum of which is from 11 to 19; and M is CN.

4,356,129

PROCESS FOR THE PREPARATION OF NEUTRAL PHOSPHOROUS ACID ARYL ESTERS

Uwe Hucks, Alpen; Erhard Tresper, and Claus Wulff, both of Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

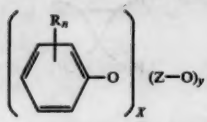
Filed Dec. 4, 1980, Ser. No. 213,136

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1979, 2950694

Int. Cl.³ C07F *9/141*

U.S. Cl. 260—973 10 Claims

1. In a process for the preparation of a neutral phosphorous acid aryl ester of the general formula



(I)

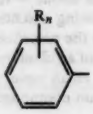
in which

each R independently represents hydrogen, halogen, a nitrile group, an alkyl, alkoxy or phenoxy radical or an optionally fused phenyl radical, or a fused aromatic ring system which is interrupted by hetero-atoms,

n denotes an integer from 1 to 5, and the radicals R can be identical or different,

X represents an integer from 1 to 3,

Z represents an alkyl radical or a radical of the formula



wherein

R and n have the above meaning, and

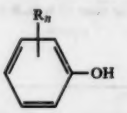
y represents 1 if x represents 2, or 2 if x represents 1, or 0 if x represents 3, by contacting a phosphorus trihalide, phosphorous acid monoester dihalide or phosphorous acid diester halide of the formula (II), (III), or (IV)

$PHal_3$	$ZOPHal_2$	$(ZO)_2PHal$
(II)	(III)	(IV)

in which

Z has the meaning already given in the case of formula (I) and

Hal represents fluorine, chlorine and/or bromine, with a hydroxyaryl compound of the general formula



(V)

in which

R and n have the meanings already given in the case of formula (I), the improvement wherein an excess of (stoichiometric) of hydroxyaryl compound and an excess (stoichiometric) of aqueous alkali metal hydroxide solution or suspension and/or alkaline earth metal hydroxide solution or suspension are employed, relative to the phosphorus halide compound, an inert organic water-immiscible solvent and/or diluent being present in an amount such that 5 to 50% strength by weight solution of the neutral phosphorous acid aryl ester is formed, and, after the reaction, the organic phase is separated off and the phosphorous acid aryl ester formed is isolated by removing the solvent and/or diluent.

4,356,130

TREATING THE RESIDUE FROM THE PRODUCTION OF PHOSPHOROCHLORIDOTHIONATES

Mark S. Carron, Spring Valley; Ronald S. La Barbera, New City; Lester P. Van Brocklin, Thiells, all of N.Y., and Pawan K. Jain, Norwood, N.J., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Oct. 2, 1980, Ser. No. 193,247

Int. Cl.³ C07F 9/20

U.S. Cl. 260—989 **12 Claims**

1. A method for treating the distillation residue from the production of dialkyl and diaryl phosphorochloridothionates comprising:

(a) mixing the hot residue with a sufficient amount of a separating solution having a specific gravity to cause a three phase mixture to form comprised of an organic phase, a separating solution phase and a sulfur phase; and

(b) recovering an organic phase which is of a lower specific gravity than the separating solution phase.

4,356,131

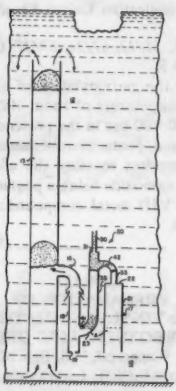
CIRCULATING DEVICE FOR LIQUIDS CONTAINING LONG-CHAIN MOLECULES

Peter Lipert, Dollard Des Ormeaux, Canada, assignor to Atara Corporation, Dorval, Canada

Filed Jan. 29, 1981, Ser. No. 229,679

Int. Cl.³ B01F 3/04

U.S. Cl. 261—77 **9 Claims**



1. In a device for creating circulation within a body of liquid, the liquid including long-chain molecules, the device comprising a substantially vertically extending stackpipe means designed to be wholly submerged within the liquid, the stackpipe having an upper discharge opening and a lower inlet opening; a large bubble generator means, also designed to be wholly submerged within the liquid, and for delivering bubbles to said stackpipe, the generator means comprising a gas accumulating chamber having an opening in the lower part thereof, and curved piping, defining a siphon, connecting the gas accumulator chamber to the stackpipe, and means for delivering gas under pressure into the accumulator chamber; the improvement comprising:

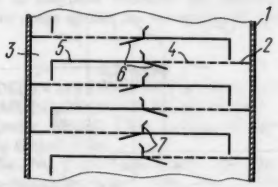
the presence of a sharp-edged baffle plate at a bend in the pipe between the gas accumulator chamber and the stackpipe, the sharp-edged baffle plate extending from the inner portion of the curve in the bent pipe towards the centerline of the pipe, so as to block at least about 10% of the cross-sectional flow area of the pipe.

4,356,132

MASS-TRANSFER APPARATUS

Viktor P. Belyakov, prospekt Lenina, 5/1, kv. 62; Alexandr S. Bronshtein, ulitsa Bykovskogo, 10, kv. 19, and Viktor S. Kortikov, ulitsa Bykovskogo, 2, kv. 63, all of Balashikha, U.S.S.R.

Filed Jun. 15, 1981, Ser. No. 273,776
Claims priority, application U.S.S.R., Dec. 26, 1977, 2558917
Int. Cl.³ B01F 3/04
U.S. Cl. 261—114 TC 5 Claims



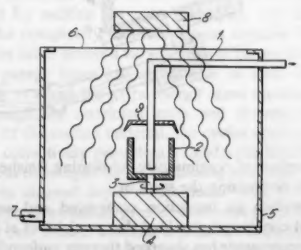
1. Mass-transfer apparatus, comprising:
a substantially vertically extending housing;
contact trays accommodated within said housing in vertical overlying relationship with each other, each of said trays including at least one perforated sector and at least one non-perforated sector, said sectors defining a borderline region therebetween, and wherein in a pair of vertically adjacent trays a perforated sector of the upper tray overlies a non-perforated sector of the lower tray and vice versa;
an overflow passageway provided at a non-perforated sector of each contact tray;
baffle means extending downwardly from the borderline region between perforated and non-perforated sectors of a tray and inclined towards a perforated sector of that tray; and
overflow deflector means extending upwardly from the borderline region between perforated and non-perforated sectors of a tray, said overflow deflector means being situated on each tray substantially below a downwardly extending inclined baffle means of the next overlying contact tray.

4,356,133

CHEMICAL PROCESS IN A MEDIUM CONNECTED TO A ROTATING BODY

Geoffrey Cowen; Philip Norton-Berry, and Margaret L. Steel, all of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Feb. 21, 1979, Ser. No. 14,233
Claims priority, application United Kingdom, Feb. 21, 1978, 6810/78
Int. Cl.³ B29C 6/00
U.S. Cl. 264—8 6 Claims



1. A chemical process comprising mixing reactants to form a reactant medium, moving the medium as a film across a surface of rotation on a rotating body by centrifugal force substantially without chemical reaction taking place between the reactants, discharging the reactant medium from the periphery of the rotating surface as a film or filaments which for an initial period after discharge from said surface remain continuous with the film still moving across said surface, and chemically reacting said reactants during said initial period.

4,356,134

PROCESS FOR THE PRODUCTION OF HYDROPHILIC FIBRES AND FILAMENTS OF SYNTHETIC POLYMERS

Ulrich Reinehr, Dormagen; Peter Hoffmann, Leverkusen, and Peter Kleinschmidt, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 14, 1977, Ser. No. 776,966
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1976, 2611193
Int. Cl.³ B29H 7/20
U.S. Cl. 264—49 4 Claims

1. A process for the production of hydrophilic polyacrylonitrile filaments and fibers having a sheath-core structure and a microporous core which comprises spinning a fiber forming wet or dry spinnable polyacrylonitrile as a composition containing, in addition to the spinning solvent
(A) from 5 to 50% by weight, based on the spinning solvent and polymer solids content, of non-solvent for the polymer to be spun, which non-solvent
(a) has a higher melting or boiling point under normal conditions than the spinning solvent,
(b) is miscible with the spinning solvent and with a liquid suitable for use as a washing liquid; and washing said non-solvent from said filaments or fibers; the improvement comprising including in said composition
(B) from 0.05 to 5% by weight, based on polyacrylonitrile solids content of at least one surface-active compound; and thereafter removing said solvent and said non-solvent.

4,356,135

PROCESS FOR THE PRODUCTION OF A CERAMIC MEMBER HAVING INCLUSIONS OF ELECTRICALLY CONDUCTIVE MATERIAL FLUSH WITH ITS SURFACE

Bernard Francois, Montbonnot, and Jean-Claude Viguie, Eybens, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Continuation of Ser. No. 24,269, Mar. 27, 1979, abandoned. This application Sep. 15, 1980, Ser. No. 187,141
Claims priority, application France, Mar. 30, 1978, 78 09253
Int. Cl.³ C04B 37/00, 39/00
U.S. Cl. 264—61 15 Claims

1. A process for the production of a cathode-solid electrolyte assembly consisting of a ceramic member having only on its surface inclusions of electrically conductive nickel joined together so as to form on said surface an electrically conductive network, which comprises:
depositing on the bottom of a mold a first layer of particles of said conductive nickel, said particles having a size between 3 and 30μ, providing a surface density of said

particles in the first layer of about 10 mg/cm^2 whereby they form after fritting an electrically conductive cathodic network,

placing above said layer of particles a second layer of the ceramic powder,

compressing together the two layers, and

fritting said compressed layers at a temperature below the melting temperature of the conductive nickel.

4,356,136

METHOD OF DENSIFYING AN ARTICLE FORMED OF REACTION BONDED SILICON NITRIDE

John A. Mangels, Flat Rock, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Aug. 29, 1980, Ser. No. 182,351
Int. Cl.^{3} C04B *35/58*
U.S. Cl. 264—65 15 Claims

1. A method of densifying an article formed of reaction bonded silicon nitride, which method comprises the steps of:

packing the reaction bonded silicon nitride article in a packing mixture consisting of silicon nitride powder and a densification aid;

subjecting the reaction bonded silicon nitride article and packing powder to a positive, low pressure nitrogen gas treatment at a pressure up to about 100 psi nitrogen pressure, while heating the reaction bonded silicon nitride article, packing powder and nitrogen gas to a treatment temperature and for a treatment time to cause any open porosity originally found in the reaction bonded silicon nitride article to be substantially closed; and thereafter

subjecting the reaction bonded silicon nitride article and packing powder to a positive, high pressure nitrogen gas treatment at a pressure in the range from about 300 psi to about 1500 psi, while heating the reaction bonded silicon nitride article, packing powder and nitrogen gas to a treatment temperature and for a treatment time to cause a sintering of the reaction bonded silicon nitride article whereby the strength of the reaction bonded silicon nitride article is increased.

4,356,137

PROCESS FOR PREPARING FRICTION CLUTCH FACING

Raymond L. Guzy, Tulsa, Okla., and Robert V. Wargin, Darien, Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 10, 1980, Ser. No. 214,841
Int. Cl.^{3} B32B *5/02*
U.S. Cl. 264—137 2 Claims

1. In a process for preparing a friction clutch facing including the steps of providing at least one continuous strand impregnated with a friction resin composition, winding said continuous strand to form an annular disc preform, and thermally curing said preform under pressure, the improvement wherein said continuous strand is impregnated by the process of extrusion coating said strand with substantially solvent-free friction resin composition comprising a rubber-modified thermosetting resin and a fiber selected from the group consisting of chopped glass fiber, chopped aramid fiber, aramid fiber pulp and mixtures thereof.

4,356,138

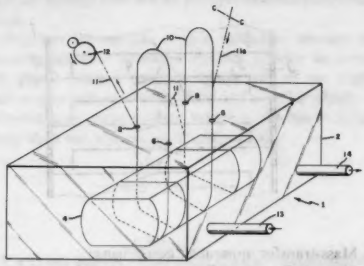
PRODUCTION OF HIGH STRENGTH POLYETHYLENE FILAMENTS

Sheldon Kavesh, Whippany; Dusan C. Prevorsek, Morristown, and Donald G. Wang, Morris Plains, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jan. 15, 1981, Ser. No. 225,288
Int. Cl.^{3} B29C *17/02*
U.S. Cl. 264—164 7 Claims

1. In a process for production of polyethylene filaments having a tenacity of at least 30 grams per denier from a hot, supersaturated polyethylene solution, said polyethylene having intrinsic viscosity in decalin at 135° C. of at least 11 dl per gram and said solution being at a temperature in the range of about 102°–120° C. and concentration in the range of 0.1–2 weight percent, said process comprising contacting fibrous seed crystals of such polyethylene with a generally arcuate surface which is at least partially immersed in said polyethylene solution whereby crystal growth is initiated by said seed crystals, and withdrawing a resulting filament:

The improvement which comprises utilizing to provide polyethylene seed, a length of filament of polyethylene as



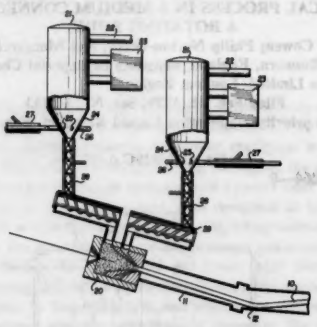
aforesaid, in contact simultaneously with said arcuate surface and said solution; maintaining said arcuate surface essentially stationary; and withdrawing the filament from said solution around said stationary arcuate surface at a rate reaching at least 80 cm per minute thereby producing tension in said filament and inducing growth of fibrous polyethylene crystals from the solution onto said filament with resulting increase in tension on the filament being withdrawn, up to a steady state tension of at least 70 grams.

4,356,139

METHOD FOR LUBRICATING CABLE IN A DRY CURING SYSTEM

Bobby A. Rowland; Stanley L. Tate, both of Carrollton, and Michael C. Smith, Newnan, all of Ga., assignors to Southwire Company, Carrollton, Ga.

Filed Dec. 12, 1980, Ser. No. 215,910
Int. Cl.^{3} B29D *3/00*; B29G *2/00*
U.S. Cl. 264—174 17 Claims



1. A method of continuously fabricating finished electrical conductor comprising the steps of:

(a) providing an insulation compound and an insulation shield compound provided that particles of at least one of said compounds has absorbed thereon uniformly dispersed incompatible lubricant;

(b) immediately extruding said lubricant, said insulation

compound and said insulation shield compound onto an advancing elongated electrical conductor; and

(c) immediately passing said insulated and insulation shielded electrical conductor through a dry curing apparatus for vulcanization thereof provided that said incompatible lubricant migrates to the outer surface of said insulated and insulation shielded electrical conductor to reduce the coefficient of friction between the outer surface of said conductor and the inner surface of said dry curing apparatus at points where said surfaces meet said insulated and insulation shielded conductor hanging in a catenary so that said insulated and insulation shielded conductor drags against the vulcanization apparatus.

4,356,140

EXTRUSION METHOD WITH SHORT CYCLE MULTICHANNEL WAVE SCREW

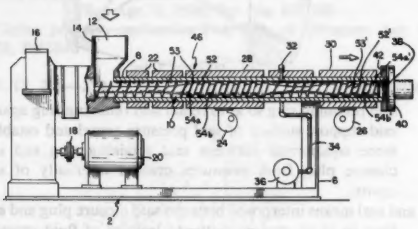
George A. Kruder, Marion, Ohio, assignor to HPM Corporation, Mount Gilead, Ohio

Division of Ser. No. 27,468, Apr. 5, 1979, Pat. No. 4,277,182, which is a continuation-in-part of Ser. No. 917,204, Jun. 20, 1978, Pat. No. 4,173,417, which is a continuation-in-part of Ser. No. 788,028, Apr. 15, 1977, abandoned. This application Feb. 4, 1981, Ser. No. 231,309

Claims priority, application United Kingdom, May 31, 1978, 26000/78

Int. Cl.³ B28B *3/20*

U.S. Cl. 264—176 R **2 Claims**



1. A method of extruding synthetic resinous material at high but steady throughput rate, without overheating and with good melt quality, comprising processing resinous material in a first zone to melt most of the material and advance it to a mixing zone, dividing the flow through said mixing zone into two parallel channels each of which has restricted cross-sectional areas at a plurality of locations along its length and with the restricted areas in one channel being longitudinally offset from the restricted areas in the other channel and with the cross-sectional area of each channel varying cyclically over at least four substantially identical cycles, the restricted cross-sectional areas being areas of decreasing channel depth terminating at the respective channel depth crests, forcing incompletely melted resinous material in each of the channels to pass through the restricted areas in that channel to receive extra energy input for melting the same throughly, and filtering a portion of the completely molten resinous material form one channel to the other across a narrow helical barrier flight with a minimum energy input just in advance of each of the restricted areas to avoid the extra energy input associated with passage through the restricted areas and thereby to avoid overheating of the melted material, the cycles reinforcing one another and collectively providing a steady material flow rate and pressure at the output end of the mixing zone, the improvement wherein channel depth crests occur with a frequency along the respective channel greater than once per pitch length of the screw and molten material is filtered across the barrier flight separating the two channels more than twice per pitch length of the screw.

4,356,141

METHOD OF CASTING SILICON INTO THIN SHEETS

Angel Sanjurjo, San Jose; David J. Rowcliffe, Los Altos, both of Calif., and Robert W. Bartlett, Tucson, Ariz., assignors to SRI International, Menlo Park, Calif.

Filed Mar. 5, 1981, Ser. No. 240,918

Int. Cl.³ C04B *35/60*

U.S. Cl. 264—332 **4 Claims**

1. The method of casting silicon into thin, flat shapes which comprises melting silicon in a graphite crucible along with one or more salts of the type having a melting point below that of silicon thereby forming a melt wherein the liquid Si takes the form of a spherical pool which sinks into the molten salt, pressing downwardly against the upper surface of the melt using a graphite tool thereby squeezing liquid salt out of the crucible while simultaneously flattening the Si pool to distribute the same into a thin flat shape, cooling the resulting liquid system to a temperature below 1410° C. to solidify the silicon component thereof and removing the resulting thin, flat silicon shape.

4,356,142

INJECTION BLOW MOLDING PET PRODUCTS

Louis Germanio, Beesley's Point, N.J., assignor to Wheaton Industries, Millville, N.J.

Filed Aug. 27, 1980, Ser. No. 181,787

Int. Cl.³ B29C *17/07*

U.S. Cl. 264—537 **3 Claims**

1. A method for injection blow molding transparent hollow objects from a polyethylene terephthalate melt comprising:

(a) cooling a parison mold and a core rod each to a preselected temperature in the range of 75°–150° F., injection molding from said melt at 530°–575° F. a parison in a mold shape formed by said core rod disposed centrally in a cavity of said parison mold, said parison having a wall thickness of 0.075–0.200 inches;

(b) quickly and uniformly cooling said parison in a manner to avoid crystallization by holding said parison in said parison mold for 1–4 seconds while continuing to cool said injection mold to said preselected mold temperature, then removing said core rod and said parison from said parison mold with the outer surface of said parison at 185°–245° F.;

(c) immediately transferring said core rod and parison to a blow mold at 40°–60° F. and introducing blow air at 100–200 psi through said core into the interior of said parison for a time period sufficient to blow said parison into the shape of said blow mold and quickly cool the blown shape also in a manner to avoid crystallization thereof.

4,356,143

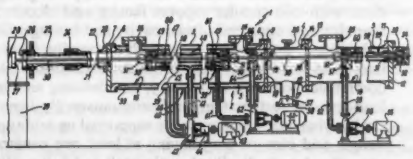
APPARATUS FOR AND A METHOD OF CURING A CONTINUOUS LENGTH OF CURABLE MATERIAL

Alan H. Hill, Bury, and Alan Lord, Bacup, both of England, assignors to General Engineering Radcliffe 1979 Limited, Manchester, England

Filed Mar. 9, 1981, Ser. No. 241,884

Int. Cl.³ B29F *3/08*

U.S. Cl. 264—557 **24 Claims**



1. Apparatus for curing a continuous length of curable mate-

rial comprising a first tubular body which defines a chamber for a heat exchange liquid, a second tubular body disposed inside the first tubular body and defining a curing chamber, inlet means leading into the tubular bodies, and outlet means leading from the tubular bodies arranged to permit a length of material to be cured to pass through the tubular bodies, first and second sealing means placed upstream and downstream respectively of the inlet and outlet means and operative to sealingly cooperate with a length of material, at least one tubular injector for injecting a heat exchange liquid into said second tubular body, a nozzle disposed downstream of the or each injector and adjacent the exit from and coaxial with the curing chamber operative to direct heat exchange liquid fed to it against the length of curable material as it leaves the curing chamber in order to strike heat exchange liquid clinging to the material from its passage through the curing chamber from the material, heat exchange liquid supply means for the supply of heat exchange liquid to the or each tubular injector and the nozzle, means for heating at least a part of the first tubular body, means for feeding a pressurised fluid to the first tubular body and means for cooling the continuous cured length of curable material emerging in operation from the second tubular body.

20. A method of curing a continuous length of curable material including the steps of supplying a heat exchange liquid to a first tubular body, pressurising the first tubular body, heating the heat exchange liquid in the first tubular body, feeding the heat exchange liquid from the first tubular body to an injector, injecting the liquid so fed into a second tubular body disposed within the first tubular body, simultaneously passing the continuous length of material through the second tubular body disposed within the first tubular body so that the heat exchange liquid passes over it, allowing the heat exchange liquid to drain back from the second tubular body to the first tubular body, feeding heat exchange liquid to a nozzle disposed at the exit end of the curing chamber and downstream thereof and directing it therefrom at the length of material leaving the chamber in order to strike heat exchange liquid clinging thereto from its passage through the curing chamber from the material, and subsequently cooling the continuous length of material.

4,356,144

CLOSURE HOLD-DOWN SYSTEM FOR A REACTOR VESSEL

Ki C. Cheung, La Jolla; Truman F. Unkle, San Diego; Arnold A. Schwartz, Solana Beach, and Raymond J. Hsieh, San Diego, all of Calif., assignors to General Atomic Company, San Diego, Calif.

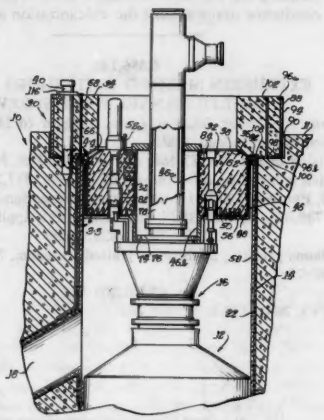
Filed Jun. 25, 1979, Ser. No. 52,066
Int. Cl.³ G21C *13/06*
U.S. Cl. 376—203 **11 Claims**

1. A closure system for use with a concrete reactor vessel having a cavity in which substantial pressure may be built up internally of the cavity, said reactor vessel defining an open end communicating with said cavity and having a support surface thereon concentric with said open end, an annular liner secured internally of said cavity and defining the outer periphery of said cavity and a substantially annular support flange adjacent said open end of said cavity, said closure comprising, in combination,

a concrete closure plug adapted to be received within said open end of said pressure vessel internally of said liner and defining an annular shoulder sized for supporting engagement with said annular support flange, said closure plug spanning said open end of said cavity and having an outer cylindrical surface spaced radially inwardly from said liner so as to define an annular space therebetween having communication with said cavity, and defining an annular load transfer surface thereon facing outwardly from said cavity when said closure plug is supported on said support flange, said closure plug having at least one penetration extending longitudinally therethrough and being adapted to support auxiliary equipment internally of said cavity,

an annular prestressed concrete retaining ring defining a first support surface thereon adapted for substantial engagement with said support surface on said reactor vessel in supporting relation therewith, said retaining ring defining an annular retaining surface adapted for substantially direct engagement with said load transfer surface of said closure plug so that pressure forces acting on said closure plug tending to separate said plug from said annular support flange are transmitted directly to said retaining ring through said load transfer surface,

a plurality of axially prestressed tendons anchored to said reactor vessel and having direct attaching relation with



said retaining ring so as to retain said retaining ring against said support surface of said pressure vessel and establish force equilibrium between said retaining ring and said closure plug from pressures created internally of said cavity,

and seal means interposed between said closure plug and said liner so as to prevent outward leakage of fluid pressure therebetween from said cavity but located to enable fluid pressure within said cavity to act radially on said outer cylindrical surface of said closure plug to effect radial compressive forces thereon.

4,356,145

PROCESS FOR LOADING THE REACTOR CAVITY OF A NUCLEAR REACTOR

Siegfried Brandes, Ladenburg; Henri-Emile Pesch, and Uwe Gutsch, both of Mannheim, all of Fed. Rep. of Germany, assignors to Hochtemperatur-Reaktorbau GmbH, Cologne, Fed. Rep. of Germany

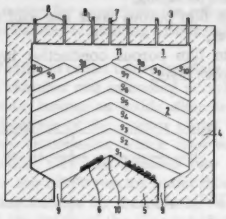
Filed Jun. 9, 1980, Ser. No. 157,383
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1979, 2923639
Int. Cl.³ G21C *19/00*
U.S. Cl. 376—265 **7 Claims**

1. A process for reloading the contaminated empty reactor cavity of a nuclear reactor with spherical operating elements forming the core of a high temperature reactor comprising:

supplying said operating elements to said reactor cavity first through a central loading tube in the roof reflector of said nuclear reactor to a predetermined load level, said loading tube being extended at the onset of the loading process toward the floor reflector and being adjusted upwardly during continued loading with the rising load level, and after reaching said predetermined load level,

supplying further operating elements through a plurality of auxiliary loading tubes in the roof reflector of said nuclear

reactor in concentric circles about said central loading tube with the loading sequence proceeding circle after



circle beginning with the circle closest to said central loading tube.

4,356,146

INCOMING AND OUTGOING AIR CONVEYANCE FOR DRY STORAGE WITH SELF HEATING RADIOACTIVE MATERIALS

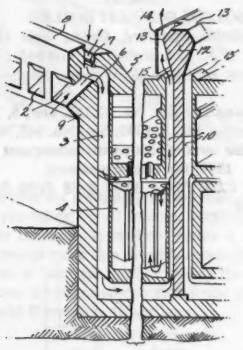
Ortwin Knappe, Grunaustrasse 19, 6450 Hanau 9, and Walter Hame, Johannes-Brahms-Strasse 16, 7520 Bruchsal, both of Fed. Rep. of Germany

Filed Apr. 3, 1980, Ser. No. 137,293

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1979, 2913540

Int. Cl.³ G21C *15/26*

U.S. Cl. 376—272 **17 Claims**



1. Incoming and outgoing air conveying means for a dry storehouse for self heating radioactive materials, and incoming and outgoing air conveying means comprising:

(a) incoming air openings and shafts and outgoing air openings and shafts wherein the incoming air openings are arranged both above and laterally on at least one incoming air shaft, the incoming air openings being provided with deflection projections or deflection edges, deflection plates situated between the upper incoming air openings and the lateral incoming air openings, said lateral incoming air openings having wall projections thereon;

(b) said incoming and outgoing air shafts being without substantial curvature up to the stored material and

(c) chimney tops having drop edges and deflection plates thereon provided on the upwardly projecting outgoing air openings and protective sills between the outgoing air shafts and said deflection plates.

4,356,147

FLUID TIGHT AND THERMALLY INSULATED COUPLING ASSEMBLY

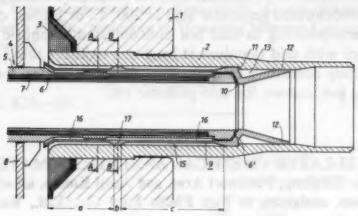
Bo Borrman, and Knud Engedal, both of Vasteras, Sweden, assignors to AB Asea-Atom, Vasteras, Sweden

Filed Mar. 5, 1979, Ser. No. 17,767

Claims priority, application Sweden, Mar. 8, 1978, 7802627

Int. Cl.³ G21C *19/32*

U.S. Cl. 376—291 **16 Claims**



1. In combination with a nuclear reactor pressure vessel containing a quantity of reactor water relatively warm as compared as compared to ambient temperature, a coupling assembly for providing an insulated, fluid-tight, passageway through an inlet in a wall in said pressure vessel, said wall having an inner and outer surface, said coupling assembly comprising:

a hollow inlet nozzle extending completely through and fixedly attached to the wall of said pressure vessel by means of a weld joint located near the inner surface of the wall, said pressure vessel containing a quantity of reactor water relatively warm as compared to ambient temperature;

a separate hollow protective sleeve extending through said inlet nozzle and shrunk fit into engagement with a portion of said inlet nozzle, said protective sleeve including a longitudinally extending outer surface portion radiclly spaced from a longitudinally extending inner surface portion of said inlet nozzle for defining a substantially cylindrically-shaped chamber therebetween, said chamber substantially spanning said inlet and including an end portion in fluid communication with an interior portion of said pressure vessel, allowing said reactor water to flow into said chamber at a temperature level above ambient temperature via direct communication with said relatively warm reactor water present within said pressure vessel, whereby said above ambient reactor water present within said chamber functions to thermally insulate the surrounding inlet nozzle from a relatively cool inlet fluid entering said pressure vessel through said protective sleeve;

a hollow conduit assembly positioned within said hollow protective sleeve and including two opposite end portions, one of said end portions positioned within said pressure vessel, the remaining end portion having a configuration substantially similar to a confronting inner surface portion of said protective sleeve, said conduit assembly also including separate, coaxial conduit portions radially spaced from one another,

spring biasing means positioned within said pressure vessel and contacting said hollow conduit assembly for biasing the remaining end portion of said hollow conduit assembly into direct, fluid-tight contact with said confronting inner surface portion of said protective sleeve to prevent fluid from flowing therebetween.

4,356,148

METHOD FOR PREVENTING CORROSION AND HYDROGEN EMBRITTLEMENT OF TANTALUM-MADE EQUIPMENT HANDLING HOT CONCENTRATED SULPHURIC ACID THEREIN

Naohiko Kagawa; Katsumi Yamamoto, both of Yokohama; Rin Sasano, Tokyo; Takao Kusakabe, Kawasaki, and Yasuhiro Moriya, Yokohama, all of Japan, assignors to JGC Corporation, Tokyo, Japan

Filed Mar. 13, 1981, Ser. No. 243,399
Claims priority, application Japan, Mar. 24, 1980, 55-36218
Int. Cl.³ C23F 11/04, 11/18
U.S. Cl. 422—9 2 Claims

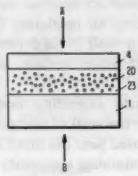
1. A method for preventing the corrosion and hydrogen embrittlement of equipment made of tantalum handling therein hot concentrated sulphuric acid at 200° C. or higher, comprising incorporating in said hot concentrated sulphuric acid in contact with said tantalum at least one oxidizer selected from the group consisting of nitric acid, nitrogen oxides, ferric ion, cupric ion, stannic ion and plumbic ion.

4,356,149

MULTI-LAYER CHEMICAL ANALYTICAL MATERIALS

Masao Kitajima; Fuminori Arai, and Asaji Kondo, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 2, 1980, Ser. No. 165,444
Claims priority, application Japan, Jul. 2, 1979, 54-83608
Int. Cl.³ G01N 21/78, 33/62
U.S. Cl. 422—56 12 Claims



1. A multi-layer chemical analytical material comprising
a light-transmitting and water-impermeable support,
a reagent layer on the support and
an aqueous liquid sample-spreading layer on the reagent layer,
wherein the reagent layer is composed of a hydrophilic binder having hydrophobic fine particles dispersed therein, said particles being water impermeable containing a reagent capable of directly or indirectly reacting with a component to be determined to provide a color change and wherein there is substantially no exposure of the reagent on the surface of said hydrophobic fine particles.

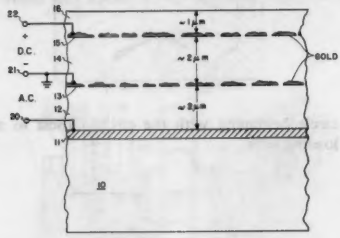
4,356,150

HUMIDITY SENSOR WITH ELECTRICAL REJECTION OF CONTAMINANTS

Robert G. Johnson, Minnetonka, and Thomas E. Hendrickson, Wayazata, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed May 15, 1981, Ser. No. 263,945
Int. Cl.³ G01R 27/02; H01L 7/00
U.S. Cl. 422—98 22 Claims

1. A thin film humidity sensor on a substrate comprising:
a first humidity sensing section including;
a metallic conductive thin film deposited on a substrate;
a first thin film porous layer, selected from a group consisting of oxides and a nitride, deposited over said metallic film;
a first thin film porous conductive layer over said porous layer, said metallic film and said first conductive layer being adapted to be connected to an AC source for energizing said humidity sensing section;
a second contaminant capture section overlaying said first sensing section including;
a second thin film porous layer like said first thin film porous layer;
a second thin film porous conductive layer over said second porous layer;



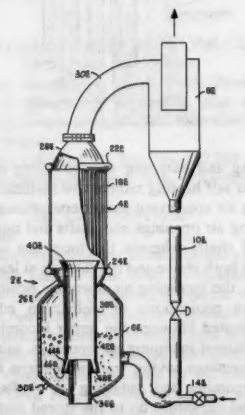
and for mechanical protection, a third thin film porous layer over said second conductive layer, the humidity thus having to diffuse through the porous layers of said contaminant capture section to enter said humidity sensing section, and said second conductive layer being adapted to be connected to a DC source to electrically bias said contaminant capture section so that specific ionic contaminants are prevented from diffusing across to the sensing region.

4,356,151

SOLIDS QUENCH BOILER

Herman N. Woebcke, Stamford, Conn.; Arju H. Bhojwani, Lawrenceville, N.J., and Robert J. Gartside, Auburndale, Mass., assignors to Stone & Webster Engineering Corp., Boston, Mass.

Continuation-in-part of Ser. No. 82,162, Oct. 5, 1979. This application Jul. 3, 1980, Ser. No. 165,784
The portion of the term of this patent subsequent to Sep. 28, 1999, has been disclaimed.
Int. Cl.³ F27B 15/16; B01J 8/28, 8/30, 8/24
U.S. Cl. 422—145 6 Claims



1. In a TRC apparatus having a reaction cracking chamber and means for quenching the cracked effluent and wherein the

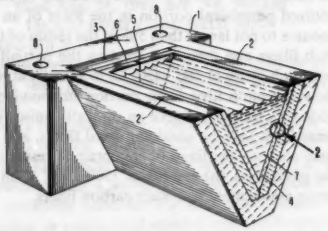
temperature in the cracking zone is between 1300° and 2500° F. and wherein the hydrocarbon feed or the hydrosulfurization residual oil along with the entrained inert solids and the diluent gas are passed through the cracking zone for a residence time of 0.05 to 2 seconds, and then quench cooled, the improvement wherein said means for quenching the effluent comprises:

a. a quench chamber containing a fluidized bed of particulate solids;
b. a reactor effluent outlet tube extending from said reaction cracking chamber and extending into the fluidized bed;
c. a riser tube having an inside diameter larger than the outside diameter of the reactor outlet tube aligned with the reactor outlet tube, which riser tube surrounds the reactor outer tube and depends into the fluidized bed below the top of the reactor outlet tube;
d. an opening defined by the outside of the reactor outlet tube and the inside of the riser tube which opening provides communication between the fluidized bed and the interior of the riser tube; and
e. an indirect heat exchanger, wherein the riser tube terminates at the entry of the hot side of the indirect heat exchanger.

4,356,152
SILICON MELTING CRUCIBLE

Samuel Berkman, Florham Park; Michael T. Duffy, Princeton Jct., and Harold E. Temple, Trenton, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 13, 1981, Ser. No. 243,441
Int. Cl.³ B01D *9/00*; C30B *29/06, 35/00*
U.S. Cl. 422—248 **11 Claims**



1. In a crucible for forming a silicon melt, the improvement comprising providing on all internal surfaces of said crucible which might contact the molten silicon a protective lining comprising one or more thin, flexible sheets of graphite each of which has on at least the surface facing the molten silicon a layer of silicon nitride or silicon oxynitride and at least one of which has said layer on both surfaces.

4,356,153
URANIUM RECOVERY PROCESS

Andre Bathellier, Sceaux, and Claude Ginisty, Villeneuve le Roi, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Nov. 16, 1979, Ser. No. 94,890
Claims priority, application France, Nov. 28, 1978, 78 33543; Jun. 15, 1979, 79 15397
Int. Cl.³ C01G *43/00*
U.S. Cl. 423—10 **12 Claims**

1. A process for the recovery of the uranium (VI) present in a phosphoric acid solution by bringing the said solution into contact with an organic solvent suitable for extracting the uranium, wherein the organic solvent comprises a system of extractants constituted by an acid organophosphorus compound, selected from the group consisting of organophosphoric acids and organophosphoric acids, and by a neutral phosphine oxide of the formula:

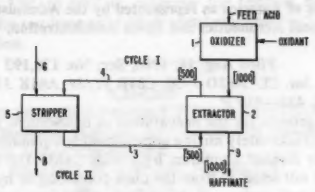
(I)

in which the radicals R_1, R_2 and R_3 are identical or different alkyl, aryl or alkoxy methyl radicals, at least one of the radicals R_1, R_2 and R_3 being an alkoxy methyl radical.

4,356,154
URANIUM EXTRACTION COEFFICIENT CONTROL IN THE PROCESS OF URANIUM EXTRACTION FROM PHOSPHORIC ACID

Jose G. Lopez, Lakeland, and Kenneth W. Gould, Winter Haven, both of Fla., assignors to Wyoming Mineral Corporation, Lakewood, Colo.

Filed Jan. 23, 1980, Ser. No. 114,465
Int. Cl.³ C01G *43/00*
U.S. Cl. 423—10 **7 Claims**



1. In the method of recovering uranium from wet process phosphoric acid containing uranium and iron ions, wherein wet process phosphoric acid feed solution is oxidized, passed through an extraction means to provide a uranium rich solvent stream and a raffinate acid stream containing iron ions, and wherein the uranium rich solvent stream is passed through a reductive stripping means, the improvement comprising measuring the oxidation potential of the raffinate acid stream after wet process acid feed extraction and maintaining the oxidation potential of the raffinate acid stream if it deviates from a value between 350 mV. and about 700 mV. by changing the amount of oxidation of the acid feed solution.

4,356,155
SULFUR PROCESS

George C. Blytas, and Zaida Diaz, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed May 26, 1981, Ser. No. 267,197
Int. Cl.³ B01D *53/34*
U.S. Cl. 423—226 **14 Claims**

1. A process for the removal of H_2S from a sour gaseous stream comprising:

(a) contacting the sour gaseous stream in a contacting zone with an aqueous reaction solution at a temperature below the melting point of sulfur, the mixture comprising an effective amount of the ferric chelate of nitrilotriacetic acid and a modifying amount of a modifier selected from compounds having the formula $C_nH_{2n-1}OH$, wherein n is a whole number from 4 to 22, and mixtures thereof, to produce a sweet gas stream and an aqueous admixture containing crystalline sulfur and a reduced reactant;
(b) removing at least a portion of the crystalline sulfur from the aqueous admixture;
(c) regenerating the aqueous admixture in a regenerating zone with oxygen to produce a regenerated reactant; and
(d) returning aqueous admixture from the regeneration zone to the contacting zone.

4,356,156

ZEOLITES BEARING FLUORIDE ANIONS

Alan Dyer, Manchester, and Abraham Araya, London, both of England, assignors to Laporte Industries Limited, London, England

Filed Jun. 10, 1980, Ser. No. 158,127

Claims priority, application United Kingdom, Jul. 3, 1979, 7923144

Int. Cl.³ C01B *33/28;* B01J *27/06, 29/06*

U.S. Cl. 423—328 11 Claims

3. A process for the production of a zeolite bearing fluoride anions and cations other than hydrogen, aluminium and silicon in which the number of equivalents of fluoride anions exceeds the sum of the numbers of equivalents of all cations present in the zeolite except for hydrogen, aluminium and silicon cations comprising treating the zeolite with an aqueous solution of at least 50% by weight KF.

4,356,157

SYNTHESIS OF DAWSONITES

Robert L. Altman, Berkeley, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 14, 1980, Ser. No. 178,192

Int. Cl.³ A62D *1/00;* C01B *31/24;* A61K *33/10*

U.S. Cl. 423—419 P 4 Claims

1. A process for the preparation of dawsonites, which comprises (a) intimately mixing approximately equimolar quantities of finely divided aluminum hydroxide ($Al(OH)_3$) and a finely divided salt selected from the class consisting of hydrogencarbonates and carbonates of sodium, potassium and ammonia; and (b) heating the mixture in an atmosphere of carbon dioxide under pressure and at a temperature and for a period of time sufficient to form dawsonite.

4,356,158

PROCESS FOR PRODUCING CARBON FIBERS

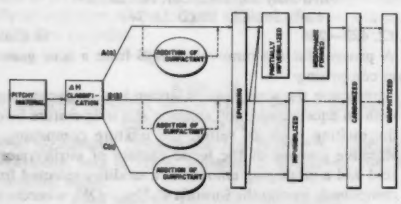
Toshikatsu Ishikawa, Tokyo; Haruo Teranishi, Machida; Akira Yokoyama, Yokohama; Tetsuo Yanagi, Yokohama, and Hirofumi Harada, Yokohama, all of Japan, assignors to Nippon Carbon Co., Ltd., Tokyo, Japan

Filed Oct. 27, 1981, Ser. No. 315,575

Claims priority, application Japan, Jul. 4, 1981, 56-103911

Int. Cl.³ D01F *9/14*

U.S. Cl. 423—447.4 5 Claims



1. A process for producing carbon fibers from pitches comprising the steps of:

(1) measuring pitches for their individual calorific values, ΔHs, to classify into (a) a pitch having $\Delta H < 10$ cal/g, (b) a pitch having $\Delta H = 10$ to 150 cal/g and (c) a pitch having $\Delta H > 150$ cal/g,

(2) melt spinning the pitch (a) to obtain pitch fibers, partially infusibilizing the thus obtained pitch fibers at ambient temperature to 280° C. in an oxidizing atmosphere to oxidize the peripheral portion of the fibers to an extent that the thickness of the resulting oxidized peripheral portion in the form of an oxide film amounts to not larger than 5% of the radius of the original pitch fibers and then heat treating the partially infusibilized pitch fibers at 360°–450° C. in an inert atmosphere to allow the pitch fiber inner portion surrounded with said oxide film to take an optically anisotropic mesophase form thereby obtaining fixed fibers,

melt spinning the pitch (b) to obtain pitch fibers, either infusibilizing the thus obtained pitch fibers at 220°–280° C. in an oxidizing atmosphere to obtain fixed fibers or partially infusibilizing the pitch fibers at ambient temperature to 280° C. in an oxidizing atmosphere to oxidize the peripheral portion of the fibers to an extent that the thickness of the resulting oxidized peripheral portion in the form of an oxide film amounts to not larger than 5% of the radius of the original pitch fibers and then heat treating the partially infusibilized pitch fibers at 360°–450° C. in an inert atmosphere to allow the pitch fiber inner portion surrounded with said oxide film to take an optically anisotropic mesophase form thereby obtaining fixed fibers,

melting the pitch (c), adding a fluorine-containing surfactant to the melted pitch (c) in an amount by weight of 0.1–10% thereof and agitating the resulting mixture, melt spinning the mixture to obtain pitch fibers, either infusibilizing the thus obtained pitch fibers at 220°–280° C. in an oxidizing atmosphere to obtain fixed fibers or partially infusibilizing the pitch fibers at ambient temperature to 280° C. in an oxidizing atmosphere to oxidize the peripheral portion of the fibers to an extent that the thickness of the resulting oxidized peripheral portion in the form of an oxide film amounts to not larger than 5% of the radius of the original pitch fibers and then heat treating the partially infusibilized pitch fibers at 360°–450° C. in an inert atmosphere to allow the pitch fiber inner portion surrounded with said oxide film thereby to take an optically anisotropic mesophase form thereby obtaining fixed fibers, and

(3) heat treating the fixed fibers obtained respectively from said pitches (a), (b) and (c), at 750°–1500° C. in a non-oxidizing atmosphere to obtain carbon fibers.

4,356,159

METHOD OF RECOVERING BROMINE FROM METHYL BROMIDE

Stephen V. Norval, Guisborough, and Peter J. V. Jones, Stockton-on-Tees, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Nov. 28, 1980, Ser. No. 210,753

Claims priority, application United Kingdom, Dec. 13, 1979, 7942974

Int. Cl.³ C01B *7/12*

U.S. Cl. 423—481 10 Claims

10. A process for recovering the bromine content of methyl bromide which is present in an effluent gas stream from a process of oxidizing a substituted aromatic compound to a carboxylic acid in the presence of a catalyst containing a source of bromine whereby methyl bromide is formed which comprises contacting the methyl bromide with oxygen at a temperature in the range of 200° to 800° C. and at a pressure of up to 100 bar in the presence of a platinum catalyst and a source of hydrogen and recovering the hydrogen bromide so produced by dissolving it in water.

4,356,160

PROCESS FOR PRODUCING TITANIUM TRIHALIDES BY REDUCING TITANIUM TETRAHALIDES

Kenya Makino, Kuwana; Hieo Sakurai; Masaru Watanabe, both of Yokkaichi, and Toshiyuki Nishimura, Kameyama, all of Japan, assignors to Japan EP Rubber Co., Ltd., Mie, Japan

Filed Apr. 16, 1981, Ser. No. 254,667
Claims priority, application Japan, Apr. 24, 1980, 55-53555
Int. Cl.³ C01G *23/02*
U.S. Cl. 423—492 9 Claims

1. In a process for producing a titanium trihalide by reducing a titanium tetrahalide with hydrogen, the improvement wherein the reduction is carried out in an organic solvent in the presence of an ether and at least one reducing catalyst selected from the group consisting of copper, zinc, titanium, cobalt, nickel, platinum, palladium and compounds of these metals.

4,356,161

PROCESS FOR REDUCING THE TOTAL SULFUR CONTENT OF A HIGH CO_2-CONTENT FEED GAS

Harold J. McNamara, Houston, and Joan A. Schilk, Tomball, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 24, 1981, Ser. No. 295,439
Int. Cl.³ C01B *17/04*; B01D *53/34*
U.S. Cl. 423—573 R 7 Claims

1. A process for reducing the total sulfur content of a high CO_2-content feed gas to environmentally acceptable levels comprising:

(a) passing a feed gas stream comprising 40 to 95% volume CO_2, 0.03 to 20% volume H_2S, and 0.02 to 2% volume COS to a first absorption step where said feed gas stream is contacted with a liquid and regenerable polyalkanolamine absorbent selective for hydrogen sulfide, therein producing an unabsorbed portion and a hydrogen sulfide-enriched polyalkanolamine absorbent;

(b) passing said unabsorbed portion of the feed gas stream from step (a) together with a hydrogen- and/or carbon monoxide-containing gas, the off gases from the associated Claus process step (e), and a certain amount of steam over a sulfided Group VI and/or Group VIII metal catalyst supported on an inorganic oxidic carrier in a reduction step wherein the amount of steam is adjusted to reduce the COS concentration in the resulting treated gas to a level below about 0.05% volume;

(c) passing the gas stream thus treated in said reduction step (b) to a second absorption step in which said treated gas stream is contacted with a liquid and regenerable polyalkanolamine absorbent under such conditions that the unabsorbed portion of said treated gas stream has below about 0.05% volume total sulfur compounds, discharging the unabsorbed portion of said treated gas stream, optionally after incineration, into the atmosphere, and producing a hydrogen sulfide-enriched polyalkanolamine absorbent;

(d) regenerating the hydrogen sulfide-enriched absorbents from absorption steps (a) and (c) by heating and/or stripping and using them again for further absorption of hydrogen sulfide;

(e) passing the hydrogen sulfide liberated in the regeneration step (d) to a Claus process step; and

(f) passing the off-gases produced in said Claus process step (e) to said reduction step (b).

4,356,162

METHOD OF OBTAINING ALKALI ALUMINATES FROM AQUEOUS SOLUTIONS

Peter Lumbeck, and Hans Exner, both of Niederkassel, Fed. Rep. of Germany, assignors to Dynamit Nobel AG, Troisdorf, Fed. Rep. of Germany

Continuation of Ser. No. 34,718, Apr. 30, 1979, abandoned. This application Mar. 2, 1981, Ser. No. 239,829
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1978, 2819004
Int. Cl.³ C01F *7/04*
U.S. Cl. 423—600 15 Claims

1. In a process for obtaining a solid alkali metal aluminate from an aqueous alkali metal aluminate solution by dehydrating the solution by a drying process, the improvement which comprises employing as the alkali metal aluminate solution a solution having an alkali metal oxide concentration of 1 to 6 mols per liter which solution has a mol ratio of alkali metal oxide to Al_2O_3 of greater than 1 and contains an organic polyhydroxyl compound in an amount of 0.1 to 5% by weight based upon the weight of the alkali aluminate solution and subjecting said solution to a spray drying process by contacting said solution with heat carrying gases or vapors at a temperature of 230° to 600° C. whereby the residual moisture content of the resultant solid alkali metal aluminate is 5 weight percent or less.

4,356,163

PROCESS FOR THE PRODUCTION OF HYDROGEN

James G. Davidson, Paducah, Ky., assignor to Davidson Research Ltd., Grand Rapids, Mich.

Filed Dec. 28, 1981, Ser. No. 334,879
Int. Cl.³ C01B *1/02*
U.S. Cl. 423—657 7 Claims

1. A process for the production of hydrogen comprising in sequence:

combining H_2O and alkali metal in a first reaction zone to produce hydrogen and alkali metal hydroxide;

removing and collecting hydrogen from said first reaction zone and transferring said alkali metal hydroxide to a second reaction zone and combining it with alkali metal to produce hydrogen and alkali metal monoxide;

removing and collecting hydrogen from said second reaction zone and transferring said alkali metal monoxide to a third reaction zone and combining it with oxygen to produce alkali metal peroxide;

transferring said alkali metal peroxide to a fourth reaction zone and combining it with carbon to produce alkali metal carbonate and alkali metal;

removing alkali metal from said fourth reaction zone and returning it to said first or said second reaction zone and transferring said alkali metal carbonate to a fifth reaction zone and heating it to produce alkali metal, oxygen and carbon dioxide; and,

removing said alkali metal from said fifth reaction zone and returning it to said first or said second reaction zone.

4,356,164

DETECTION OF NON-A, NON-B HEPATITIS ASSOCIATED ANTIGEN

Edward Tabor, Rockville, and Robert J. Gerety, Potomac, both of Md., assignors to Govt. of the U.S., as represented by the Secretary, Dept. of Health & Human Services, Washington, D.C.

Filed May 21, 1979, Ser. No. 40,921
Int. Cl.³ G01N *33/56*, *33/58*
U.S. Cl. 424—1 9 Claims

1. A method of assaying for the amount of non-A, non-B hepatitis antigen present in a sample comprising a first step of reacting antigen in the sample with the antibody, a second step of separating reactive phase from non-reactive phase by precipitating antibody from serum and purifying said antibody,

and a third step of measuring the extent of the reaction as a measurement of the amount of non-A, non-B hepatitis antigen present in the sample.

4,356,165

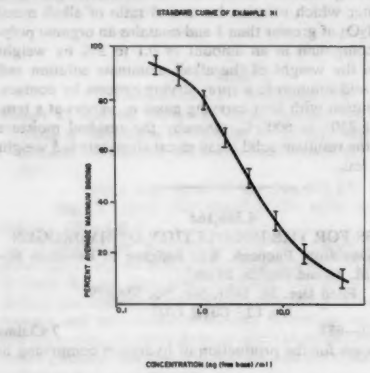
BUPROPION RADIOIMMUNOASSAY, AND KIT

John W. A. Findlay, Chapel Hill; Robert F. Butz, Durham, and Richard M. Welch, Raleigh, all of N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Apr. 14, 1980, Ser. No. 140,158

Int. Cl.³ G01N *33/56, 33/60;* B65D *71/00*

U.S. Cl. 424—1 **33 Claims**



1. The method of determining the concentration of bupropion and any active metabolites thereof in a body fluid containing same comprising (a) mixing together antisera comprising buproprion-specific antibodies, a labeled competitor of buproprion. capable of competing with bupropion for binding to said antisera and body fluid, and (b) mixing together a concentration of a standard amount of bupropion, antisera and a labeled competitor of bupropion, and (c) measuring the portion of labeled competitor either bound or unbound to the antibodies in each of step (a) and step (b) and comparing the results for step (a) with the results for step (b).

4,356,166

TIME-RELEASE CHEMICAL DELIVERY SYSTEM

Robert V. Peterson, Murray, Utah; James M. Anderson, Cleveland Heights, Ohio; Donald E. Gregonis; Sunj-Wan Kim, both of Salt Lake City, Utah, and Jan Feijen, Hengelo, Netherlands, assignors to University of Utah, Salt Lake City, Utah

Filed Dec. 8, 1978, Ser. No. 967,605

Int. Cl.² A61J *3/00, 3/10;* A61K *9/54*

U.S. Cl. 424—19 **10 Claims**

1. A time release chemical delivery system for implantation in animal host comprising:

a polymeric, water-insoluble, biodegradable polymer which biodegrades into fragments tolerable by the host; and

a bioactive compound chemically attached to said carrier by a hydrolyzable bond, said bioactive compound containing a group which reacts with a group on the biodegradable polymer to form a hydrolyzable bond and being effective in small dosages to produce a biological effect within said host upon release into the host by hydrolysis of the hydrolyzable bond.

4,356,167

LIPOSOME DRUG DELIVERY SYSTEMS

Lawrence A. Kelly, Morris Plains, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 234,484, Feb. 17, 1981, abandoned, which is a continuation of Ser. No. 2,962, Jan. 12, 1979, abandoned, which is a continuation-in-part of Ser. No. 872,835, Jan. 27, 1978, abandoned. This application Jun. 22, 1981, Ser. No. 276,034

Int. Cl.³ A61K *9/50, 37/02, 37/22;* B01J *13/02*

U.S. Cl. 424—38 **21 Claims**

1. A liposome medicament delivery system comprising a medicament encapsulated in a liposome comprising an aliphatic lipid-sterol-water lamellae, wherein the aliphatic lipid is a sodium or potassium salt of a fatty acid having from 4 to 18 carbon atoms, in a lipid concentration which forms micelles above the critical micelle concentration, and wherein the sterol is present in an amount capable of being penetrated by the micelles of the aliphatic lipid.

4,356,168

OPACIFIED DENTAL CREAM CONTAINING A BINARY FLUORINE-PROVIDING SYSTEM

Kenneth Harvey, Wilmslow; Stephen T. Connors, Sale, both of England, and Eric Baines, New South Wales, Australia, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed May 11, 1981, Ser. No. 262,013

Int. Cl.³ A61K *7/16, 7/18*

U.S. Cl. 424—52 **5 Claims**

1. An opaque dental cream comprising 2–7% by weight water, 50–80% by weight of humectant, about 0.1–5% by weight of gelling agent, about 7–8% by weight of silica filler supplementing said gelling agent, about 1–5% by weight of surface active agent, 0.5–2% by weight of an opacifying agent selected from the group consisting of titanium dioxide and zinc oxide and mixtures thereof, a binary fluorine-providing system which provides about 750–1225 ppm fluoride from sodium monofluorophosphate and 50–1000 ppm fluorine from sodium fluoride and 15–20% by weight of a polishing agent consisting essentially of a sodium aluminosilicate synthetic precipitated silica containing about 1% of alumina interbonded therewith.

4,356,169

METHOD OF PREPARING AN IMMUNOGENIC MEMBRANE PROTEIN AGGREGATE OF INFLUENZA AND PARAINFLUENZA VIRUSES AND RHABDOVIRUSES

Kai Simons, and Ari Helenius, both of Heidelberg, Fed. Rep. of Germany, assignors to Europaisches Laboratorium Fur, Heidelberg, Fed. Rep. of Germany

Filed Mar. 30, 1981, Ser. No. 248,785

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1980, 3014189

Int. Cl.³ A61K *39/12, 39/205, 39/155, 39/145*

U.S. Cl. 424—89 **8 Claims**

1. Process of preparing immunogenically active, lipid- and detergent-free soluble aggregates of amphiphilic membrane proteins of parainfluenza-, influenza- or rhabdo-viruses by extraction of the membrane with surface active agents, which process comprises mixing the virus with a nonionic bile acid detergent, layering the mixture in buffered aqueous salt solution above a detergent-free sugar gradient which in turn is over-layered with a detergent-containing sugar solution, centrifuging the resulting mixture at a centrifugal force of at least 150,000 g, isolating the protein-containing fraction, dialyzing same against the buffered solution, and then lyophilizing the obtained protein micelle solution.

4,356,170

IMMUNOGENIC POLYSACCHARIDE-PROTEIN CONJUGATES

Harold J. Jennings, Ottawa, Canada, and Czeslaw Lugowski, Wroclaw, Poland, assignors to Canadian Patents & Development Ltd., Ottawa, Canada

Filed May 27, 1981, Ser. No. 267,440
Int. Cl.³ A61K *39/385*
U.S. Cl. 424—92 26 Claims

1. A method of preparing antigenic polysaccharide: protein conjugates, comprising:

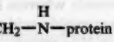
(a) providing an antigenic polysaccharide which has reactive vicinal hydroxyl groups in a terminal portion of the molecule and has a MW above about 2000;

(b) subjecting said vicinal hydroxyl groups at a terminal location to controlled oxidation only sufficient to generate a terminal reactive aldehyde group therefrom on the polysaccharide;

(c) selecting a physiologically-tolerated protein having a free amino group and reacting said amino group with said aldehyde group by reductive amination, to covalently link said polysaccharide and protein; and

(d) recovering a substantially non-crosslinked, soluble, antigenic polysaccharide:protein conjugate.

11. An antigenic-polysaccharide:protein conjugate wherein the polysaccharide and protein are covalently linked through a



linkage to a terminal portion of the polysaccharide without significant cross-linking, said antigenic polysaccharide having a MW above about 2000.

4,356,171

NOVEL GLYCOPROTEINS

Rene Zalisz, Saint-Ouen l'Aumone, and Marie-France Salles, Paris, both of France, assignors to Roussel Uclaf, Paris, France

Filed Sep. 10, 1981, Ser. No. 300,928
Int. Cl.³ A61K *37/02, 39/108, 39/40*
U.S. Cl. 424—92 14 Claims

1. Water-immunostimulating glycoproteins extracted from *Klebsiella Pneumoniae* containing 20 to 35% by weight of proteins, 50 to 70% by weight of neutral saccharides, 3 to 8% by weight of glucuronic acid, 1.5 to 3% by weight of osamines and having a molecular weight greater than 100,000 daltons.

4,356,172

ERYTHROCYTE PRESERVATIVE AND BLOOD PRODUCTS FOR LONG-TERM STORAGE

Makoto Nakao; Toshiko Nakao; Fumiko Nagai; Masako Dogen, all of Tokyo, and Yoshitomi Tabata, Kamakura, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Aug. 15, 1980, Ser. No. 178,438
Claims priority, application Japan, Mar. 31, 1980, 55-42623
Int. Cl.³ A61K *35/14*
U.S. Cl. 424—101 4 Claims

1. A blood product for long-term storage which comprises erythrocytes and an erythrocyte preservative containing effective amounts of a disaccharide as an erythrocyte membrane strengthening agent, adenine, inosine, and a anti-coagulant.

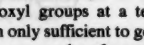
4,356,173

IGM DERIVATIVES AND PROCESS FOR THE PREPARATION THEREOF

Shuzi Miura, Hino; Tsunemasa Yoshida, Hachioji; Shoji Ono, Kodaira; Yasuhiko Masuho, and Shuzo Sawada, both of Hino, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Apr. 17, 1981, Ser. No. 255,087
Claims priority, application Japan, Apr. 18, 1980, 55-50259
Int. Cl.³ A61K *35/14, 37/00*; C07G *7/00*
U.S. Cl. 424—101 10 Claims

1. IgM derivatives into which acyl groups expressed by the following formula (I) are introduced to make their anticomplement activity weak by acylating the free amino groups existing in IgM up to 1–30% (acylation percentage)



(I)

where R indicates an alkyl group having 1 to 4 carbon atoms, or a carboxylated alkyl group expressed by $-(CH_2)_mCOOH$ (m is 2 or 3) or $-CH=CHCOOH$.

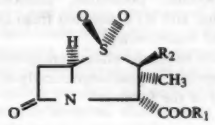
4,356,174

BETA-LACTAMASE INHIBITING 2-BETA-SUBSTITUTED-2-ALPHA-METHYL-(5R)PENAM-3-ALPHA-CARBOXYLIC ACID 1,1-DIOXIDES AND INTERMEDIATES THEREFOR

Wayne E. Barth, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Sep. 14, 1981, Ser. No. 301,995
Int. Cl.³ A61K *31/43, 31/425*; C07D *499/68, 513/04*
U.S. Cl. 424—114 14 Claims

1. A compound having the formula

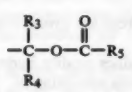


wherein R_1 is selected from the group consisting of

(a) hydrogen;

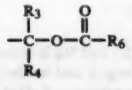
(b) ester forming residues readily hydrolyzable in vivo selected from the group consisting of

(1) 3-phthalidyl, 4-crotonolactonyl and gamma-butyrolacton-4-yl;



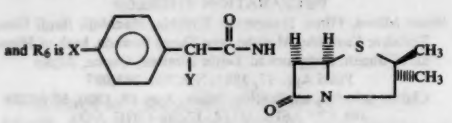
(2)

wherein each of R_3 and R_4 is selected from the group consisting of hydrogen and methyl; and R_5 is selected from the group consisting of alkyl having from 1 to 5 carbon atoms and alkoxy having from 1 to 5 carbon atoms; and



(3)

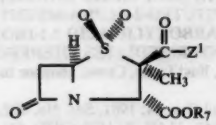
wherein each of R_3 and R_4 is selected from the group consisting of hydrogen and methyl;



wherein X is selected from the group consisting of hydrogen and hydroxy; and Y is selected from the group consisting of azido and amino;

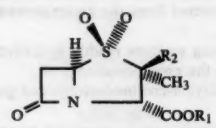
(c) carboxy protecting group selected from the group consisting of benzyl and 4-nitrobenzyl; R_2 is selected from the group consisting of CN and CO-Z; Z is selected from the group consisting of alkoxy having from 1 to 4 carbon atoms; omega-hydroxyalkoxy having from 2 to 4 carbon atoms; carboalkoxymethoxy having from 3 to 6 carbon atoms; dialkylamino wherein each alkyl group has from 1 to 4 carbon atoms; omega-acetamidoalkoxy having from 2 to 4 carbon atoms in the alkoxy group, and methyl; or a pharmaceutically-acceptable base salt of those compounds wherein R_1 is hydrogen; or a pharmaceutically-acceptable acid addition salt of those compounds wherein Y is amino.

8. A compound having the formula



wherein Z^1 is selected from the group consisting of amino, chloro, hydroxy and OM wherein M is selected from the group consisting of sodium, potassium, ammonium and n-tetrabutylammonium; and R_7 is selected from the group consisting of benzyl and 4-nitrobenzyl.

9. A beta-lactam antibiotic effectiveness enhancing composition which comprises a pharmaceutically-acceptable carrier and a compound of the formula

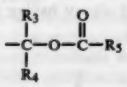


wherein R_1 is selected from the group consisting of

(a) hydrogen;

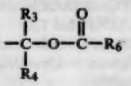
(b) ester forming residues readily hydrolyzable in vivo selected from the group consisting of

(1) 3-phthalidyl, 4-crotonolactonyl and gamma-butyrolacton-4-yl;



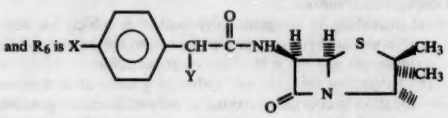
(2)

wherein each of R_3 and R_4 is selected from the group consisting of hydrogen and methyl; and R_5 is selected from the group consisting of alkyl having from 1 to 5 carbon atoms and alkoxy having from 1 to 5 carbon atoms; and



(3)

wherein each of R_3 and R_4 is selected from the group consisting of hydrogen and methyl;



wherein X is selected from the group consisting of hydrogen and hydroxy; and Y is selected from the group consisting of azido and amino; R_2 is selected from the group consisting of CN and CO-Z; Z is selected from the group consisting of alkoxy having from 1 to 4 carbon atoms; omega-hydroxyalkoxy having from 2 to 4 carbon atoms; carboalkoxymethoxy having from 3 to 6 carbon atoms; dialkylamino wherein each alkyl group has from 1 to 4 carbon atoms; omega-acetamidoalkoxy having from 2 to 4 carbon atoms in the alkoxy group, and methyl; or a pharmaceutically-acceptable base salt of those compounds wherein R_1 is hydrogen; or a pharmaceutically-acceptable acid addition salt of those compounds wherein Y is amino.

4,356,175

17β-HYDROXY-17α-METHYL-5α-ANDROSTANO-[3,2-C]PYRAZOLE 17-METHYL ETHER

Donald J. Tindall, and Anthony R. Means, both of Houston, Tex., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Oct. 10, 1978, Ser. No. 949,798

Int. Cl.³ A61K *31/58*

U.S. Cl. 424—241 **8 Claims**

1. 17β-Hydroxy-17α-methyl-5α-androstano[3,2-c]pyrazole 17-methyl ether.

2. A pharmaceutical composition for oral administration which comprises a contraceptively effective amount of 17β-hydroxy-17α-methyl-5α-androstano[3,2-c]pyrazole 17-methyl ether and appropriate pharmaceutically acceptable carriers.

4,356,176

DIBENZ[c,e]AZEPINES

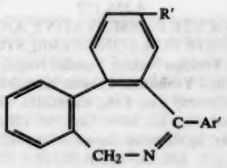
Heinz W. Gschwend, New Providence, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 106,645, Dec. 26, 1979, Pat. No. 4,315,926. This application Nov. 14, 1980, Ser. No. 206,938

Int. Cl.³ A61K *31/435*; C07D *401/04*

U.S. Cl. 424—244 **5 Claims**

1. A compound having the formula



wherein Ar' is pyridyl and R' is fluoro, chloro, bromo or trifluoromethyl; or a pharmaceutically acceptable acid addition salt thereof.

4. An anxiolytic, pharmaceutical composition comprising a

correspondingly effective amount of a compound as claimed in claim 1, together with a pharmaceutical excipient.

5. A method of treating anxiety which comprises administering to said mammals enterally or parenterally an effective dosage of a composition as claimed in claim 4.

4,356,177
MYOCARDIUM-PROTECTING PYRIDINE DERIVATIVES HAVING AN ANTI-ARRHYTHMIC ACTIVITY AND AN ACTIVITY AS BLOOD-PLATELETS ANTIAGGREGANTS

Henri Demarne, Montpellier; Claude Bernhart, Saint Gely du Fesc, and Jacqueline Lansen, Montpellier, all of France, assignors to C.M. Industries, Paris, France

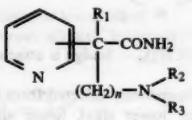
Filed Oct. 7, 1980, Ser. No. 194,829

Claims priority, application France, Oct. 11, 1979, 79 25370

Int. Cl.³ A61K *31/535;* **C07D** *413/06*

U.S. Cl. 424—248.54 **23 Claims**

1. A compound of the formula:



wherein:

the floating moiety is substituted in the 2-, 3- or 4-position of the ring;

R_1 is alkyl, or alicyclic or 1 to 10 carbon atoms;

R_2 and R_3 are alkyl or alicyclic of 1 to 6 carbon atoms, or R_2 and R_3, together with the nitrogen to which they are bonded, form a piperidine or morpholine unsubstituted or substituted by methyl; and

n is 2, 3 or 4.

16. A method of treating arrhythmia in a patient suffering therefrom which comprises administering to the patient an effective antiarrhythmic amount of the compound of claim 1.

4,356,178
3,4-(BIS-SUBSTITUTED)-1,2,5-OXDIAZOLE 2-OXIDES, THEIR USE AND PHARMACEUTICAL FORMULATIONS CONTAINING THEM

Karl Schönafinger; Rudi Beyerle; Anton Mogilev, all of Frankfurt am Main; Helmut Bohn; Melitta Just, both of Schöneck; Piero A. Martorana, Bad Homburg, and Rolf-Eberhard Nitz, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

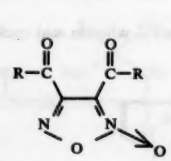
Filed Dec. 18, 1981, Ser. No. 332,234

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1980, 3047730

Int. Cl.³ A61K *31/535, 31/42;* **C07D** *413/14*

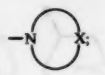
U.S. Cl. 424—248.54 **16 Claims**

1. A 3,4-(bis-substituted)-1,2,5-oxdiazole 2-oxide of the formula



wherein

R is $—NHR^1$, $—NR^2R^3$, $—NHR^4OR^2$, $—NHR^5COR^6$ or



R^1 is alkyl having from 1 to 6 carbon atoms or cycloalkyl having from 4 to 7 ring carbon atoms;

each of

R^2 and R^3 is, independently, alkyl having from 1 to 4 carbon atoms;

R^4 is alkylene of the formula $—C_nH_{2n}—$;

R^5 is alkylene of the formula $—C_mH_{2m}—$;

R^6 is $—OR^2$, $—NHR^1$, $—NR^2R^3$ or $—NH_2$;

X is $—(CH_2)_p—$, $—(CH_2)_2—O—(CH_2)_2—$ or $—(CH_2)_2—N(R^2)—(CH_2)_2—$;

m is 1, 2 or 3;

n is 2, 3 or 4; and

p is 4, 5 or 6;

or a pharmacologically-acceptable acid-addition salt thereof.

14. A method for treating or for prophylaxis of human cardiovascular-system disease which comprises administering an effective amount of a compound according to one of claims 1 and 10 to 13 to a human afflicted with or prone to such disease.

4,356,179
FORMALDEHYDE PRODUCTS AS AGRICULTURAL FUNGICIDES

Alfredo Petteruti, Via Garibaldi 35, Sessa Aurunca (Caserta), Italy

Filed Nov. 20, 1979, Ser. No. 96,185

Claims priority, application Italy, Nov. 22, 1978, 6405 A/78; May 29, 1979, 40431 A/79

Int. Cl.³ A01N *31/14, 35/02, 43/64, 47/28*

U.S. Cl. 424—249 **9 Claims**

1. A method of preventing or treating the diseases of bark cancer in chestnut trees and of gummosis in peach, apricot, plum, black cherry and cherry trees caused by fungi or bacteria, which method comprises applying to the bark or leaves of the trees by spraying or painting, an aqueous solution containing an amount effective against said fungi or bacteria of a formaldehyde reaction product selected from the group consisting of monomethyleneurea, dimethylene urea, monomethylolurea, dimethylolurea, dimethylol urea dimethyl ether, trimethylolmelamine trimethyl ether and hexamethylolmelamine hexamethyl ether.

4,356,180
INSECT REPELLANTS

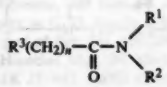
Terrence P. McGovern, Bowie, Md., and Carl E. Schreck, Gainesville, Fla., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 40,253, May 18, 1979, Pat. No. 4,298,612, which is a division of Ser. No. 8,814, Feb. 2, 1979, Pat. No. 4,291,041. This application Mar. 19, 1981, Ser. No. 245,463

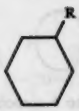
Int. Cl.³ A01N *43/36, 43/40, 43/48*

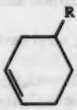
U.S. Cl. 424—250 **15 Claims**

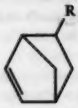
1. A method of repelling insects comprising applying to the skin or to clothing an effective insect repellent amount of a compound of the formula



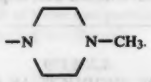
wherein R^3 is one of the groups A, B, or C


(A)


(B)


(C)

R is hydrogen or lower alkyl, n is zero or the positive integer one, two, or three, R^1 and R^2 taken together with the N is



4,356,181

ANTI-ALLERGIC MONO SALT OF 6-METHYLAMINO-4-OXO-10-PROPYL-4H-PYRANO[3,2-g]-QUINOLINE-2,8-DICARBOXYLIC ACID

David W. Payling, and John L. Suschitzky, both of Loughborough, England, assignors to Fisons Limited, London, England

Filed Mar. 26, 1981, Ser. No. 247,896

Claims priority, application United Kingdom, Apr. 2, 1980, 8011039

Int. Cl.³ A61K *31/47*; C07D *491/052*

U.S. Cl. 424—258 **12 Claims**

1. A mono salt of 6-methylamino-4-oxo-10-propyl-4H-pyrano[3,2-g]-quinoline-2,8-dicarboxylic acid with a strongly basic pharmaceutically acceptable cation.

11. A method of treatment of reversible airway obstruction or of prevention of the excretion of excess mucous which comprises administering an effective amount of a salt according to claim 1 to an individual suffering or liable to suffer from such a condition.

4,356,182

MERCAPTOACYL DERIVATIVES OF 4-DISUBSTITUTED PROLINES

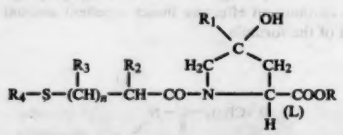
John Krapcho, Somerset, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 86,905, Oct. 22, 1979, Pat. No. 4,291,040. This application Feb. 2, 1981, Ser. No. 230,206

Int. Cl.³ A61K *31/44, 31/40*; C07D *207/16, 401/04*

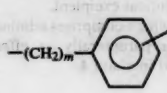
U.S. Cl. 424—263 **24 Claims**

1. A compound of the formula

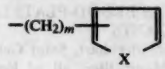


wherein R is hydrogen or lower alkyl;

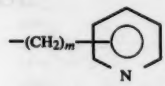
R_1 is lower alkyl, lower alkenyl, lower alkynyl,



$-(CH_2)_m$-cycloalkyl wherein said cycloalkyl ring is of 3 to 7 carbons, α-naphthyl, β-naphthyl,



wherein said $-(CH_2)_m-$ bridge is attached to an available carbon atom, or



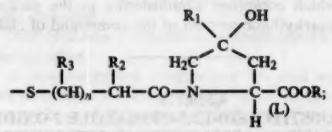
wherein said $-(CH_2)_m-$ bridge is attached to an available carbon atom;

R_2 and R_3 are independently selected from the group consisting of hydrogen, lower alkyl, lower alkylthio, and halo substituted lower alkyl;

n is zero, one or two;

R_4 is hydrogen,

p-methoxybenzyl, t-butoxycarbonyl, p-methoxybenzyloxycarbonyl, or

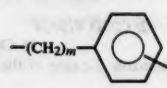


R_6 is hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, fluoro, bromo, trifluoromethyl, or hydroxy;

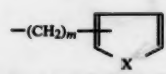
m is zero, one, two or three;

X is O or S; and

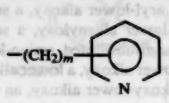
R_7 is lower alkyl of 1 to 6 carbons, lower alkyl substituted with one or more chloro, bromo, or fluoro groups,



$-(CH_2)_m-$cycloalkyl wherein said cycloalkyl ring is of 3 to 7 carbons,

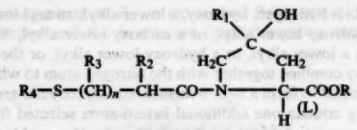


wherein said $-(CH_2)_m-$ bridge is attached to an available carbon atom, or



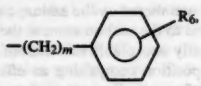
wherein said —$(CH_2)_m$— bridge is attached to an available carbon atom.

23. A composition useful for treating hypertension comprising a pharmaceutically acceptable carrier and one or more hypotensive agents of the formula

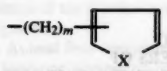


wherein R is hydrogen or lower alkyl;

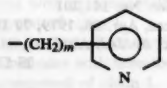
R_1 is lower alkyl, lower alkenyl, lower alkynyl,



—$(CH_2)_m$—cycloalkyl wherein said cycloalkyl ring is of 3 to 7 carbon atoms, α-naphthyl, β-naphthyl,



wherein said —$(CH_2)_m$— bridge is attached to an available carbon, or

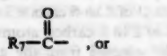


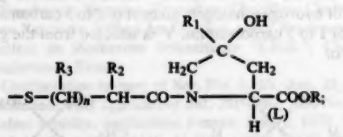
wherein said —$(CH_2)_m$— bridge is attached to an available carbon;

R_2 and R_3 are independently selected from the group consisting of hydrogen, lower alkyl, lower alkylthio, and halo substituted lower alkyl;

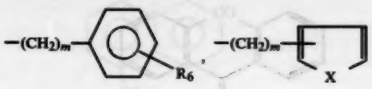
n is zero, one or two;

R_4 is hydrogen,

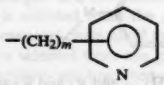




R_7 is lower alkyl of 1 to 6 carbons, lower alkyl substituted with one or more chloro, bromo or fluoro groups, —$(CH_2)_m$—cycloalkyl wherein said cycloalkyl ring is of 3 to 7 carbons,



wherein said —$(CH_2)_m$— bridge is attached to an available carbon atom, or



wherein said —$(CH_2)_m$— bridge is attached to an available carbon atom;

R_6 is hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, fluoro, bromo, trifluoromethyl, or hydroxy;

m is zero, one, two or three; and

X is O or S.

4,356,183

ANTIHYPERTENSIVE 4-THIAZOLIDINECARBOXYLIC ACIDS (PYRIDYL DERIVATIVES)

Junichi Iwao, Takarazuka; Masayuki Oya, Osaka; Toshio Baba, Suita; Tadashi Iso, Tondabayashi, and Takehisa Chiba, Kyoto, all of Japan, assignors to Santen Pharmaceutical Co., Ltd., Osaka, Japan

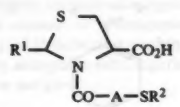
Division of Ser. No. 23,397, Mar. 23, 1979. This application Mar. 2, 1981, Ser. No. 239,602

Claims priority, application Japan, Apr. 8, 1978, 53-41632; Apr. 25, 1978, 53-49657; Jul. 3, 1978, 53-81116

Int. Cl.[3] **C07D** *417/04;* **A61K** *31/44*

U.S. Cl. 424—263 **22 Claims**

1. A compound of the formula



(I)

wherein R^1 is selected from the group consisting of pyridyl and pyridyl substituted by lower alkyl;

R^2 is hydrogen or benzoyl;

A is straight or branched alkylene of 1 to 3 carbon atoms; and pharmaceutically acceptable salts thereof; wherein the terms lower alkyl, lower alkoxy, lower alkylene and lower alkanoyl refer to groups having 1 to 6 carbon atoms.

21. A method for reducing blood pressure which comprises orally or parenternally administering an effective amount of a compound of any one of claims **1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15,** or **17** sufficient to reduce blood pressure, and at least one pharmaceutically acceptable excipient.

4,356,184

ANTI-ALLERGIC OR ANTIHYPERTENSIVE 1-PIPERIDINYLMETHYL BENZENAMINES

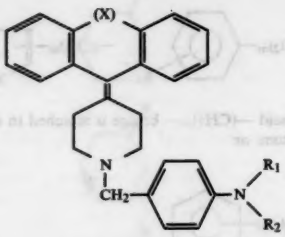
James R. Deason, Wilmette, and Richard A. Partis, Evanston, both of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Continuation-in-part of Ser. No. 156,248, Jun. 4, 1980, abandoned. This application Mar. 25, 1981, Ser. No. 247,568

Int. Cl.[3] **A61K** *31/445;* **C07D** *409/04, 211/14*

U.S. Cl. 424—267 **8 Claims**

1. A 1-piperidinylmethyl benzenamine represented by the formula:



wherein: X is —S— or —CH_2—CH_2—; and R_1 and R_2 are the same or different members of the group consisting of hydrogen or loweralkyl; or a the pharmaceutically acceptable salt thereof.

6. An anti-allergic or antihypertensive pharmaceutical composition comprising a therapeutically effective amount of a compound of claim 1 and a pharmaceutically acceptable carrier or diluent.

4,356,185

THIAZOLES

John F. Cavalla, Isleworth, England, assignor to John Wyeth & Brother Limited, Maidenhead, England

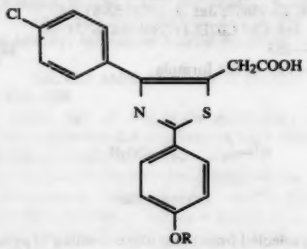
Filed Mar. 25, 1981, Ser. No. 247,461

Claims priority, application United Kingdom, Apr. 3, 1980, 8011251; Apr. 26, 1980, 8013860

Int. Cl.³ C07D *233/54;* **A61K** *31/425*

U.S. Cl. 424—270 **5 Claims**

1. A compound of formula



(I)

or a pharmaceutically acceptable salt thereof, wherein R is alkanoyl of 2 to 7 carbon atoms.

4,356,186

ACETIC ACID DERIVATIVES AND COMPOSITION CONTAINING THE SAME

Hitoshi Uno, Takatsuki; Mikio Kurokawa, Kobe, and Hideo Nakamura, Tenri, all of Japan, assignors to Dainippon Pharmaceutical Co., Ltd., Japan

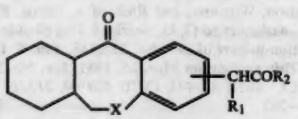
Filed Mar. 20, 1981, Ser. No. 246,114

Claims priority, application Japan, Mar. 31, 1980, 55/42167

Int. Cl.³ A61K *31/335, 31/38;* **C07D** *313/12, 337/12*

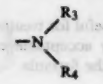
U.S. Cl. 424—275 **22 Claims**

1. A compound of the formula



(I)

wherein X is oxygen or sulfur; R_1 is hydrogen or a lower alkyl; R_2 is hydroxy, an alkoxy, an alkenyloxy, a cycloalkyloxy, an aryloxy, a substituted aryloxy, an aryl-lower alkoxy, a substituted aryl-lower alkoxy, an aryl-lower alkenyloxy, a substituted aryl-lower alkenyloxy, an ω-disubstituted amino-lower alkoxy, a lower alkoxy-carbonyl-lower alkoxy, a lower alkoxy-lower alkoxy, a hydroxy-lower alkoxy-lower alkoxy, an acyl-lower alkoxy, or a group



wherein R_3 is hydrogen, hydroxy, a lower alkyl, an aryl-lower alkyl, a hydroxy-lower alkyl, or a carboxy-lower alkyl, R_4 is hydrogen, a lower alkyl, or a hydroxy-lower alkyl, or the R_3 and R_4 may combine together with the nitrogen atom to which they are joined to form a 5- or 6-membered heterocyclic group which may contain one additional hetero-atom selected from the group consisting of nitrogen, oxygen and sulfur, said heterocyclic group being optionally substituted with a lower alkyl or a hydroxy-lower alkyl, and in the foregoing definition the substituent in the substituted aryl is a halogen, a lower alkyl or a lower alkoxy and the disubstituent in the w-disubstituted amino is two alkyl or a 5- or 6-membered cyclic amino; and the group —$CH(R_1)COR_2$ is joined to the carbon atom at the 2- or 3-position, or a pharmaceutically acceptable salt thereof.

16. A pharmaceutical composition comprising an effective amount of a compound of the formula (I) as set forth in claim 1, or a pharmaceutically acceptable salt thereof and a pharmaceutically acceptable carrier.

4,356,187

NOVEL ESTERS OF 2-METHYL-3-ALLYL-4-SUBSTITUTED-CYCLOPENT-2-ENE-1-YL

Jacques Martel, Bondy; Jean Tessier, Vincennes, and Andre Teche, Nanterre, all of France, assignors to Roussel Uclaf, Paris, France

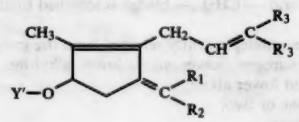
Filed Apr. 17, 1980, Ser. No. 141,201

Claims priority, application France, Apr. 26, 1979, 79 10651

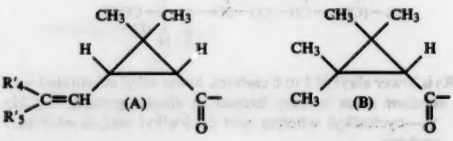
Int. Cl.³ C07C *121/48, 121/66, 69/743;* **A01N** *37/08*

U.S. Cl. 424—304 **28 Claims**

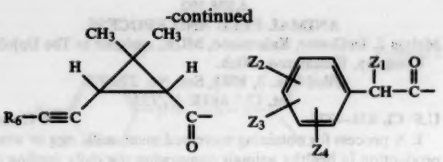
1. An ester of the formula



wherein R_1 and R_2 are individually selected from the group consisting of hydrogen, halogen, alkyl of 1 to 6 carbon atoms, phenyl, naphthyl, alkoxy-carbonyl of 2 to 5 carbon atoms and —CN, R_3 and R_3' are individually selected from the group consisting of hydrogen, halogen, alkenyl of 2 to 3 carbon atoms and alkyl of 1 to 3 carbon atoms, Y' is selected from the group consisting of

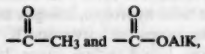


-continued



(C) (D)

R_4' and R_5' are individually selected from the group consisting of hydrogen, alkyl of 1 to 4 carbon atoms, fluorine, bromine, chlorine or R_4' and R_5' together with the carbon atom to which they are attached form a hydrocarbon ring of 3 to 7 chain members or R_4' is cyano and R_5' is phenyl or R_4' is hydrogen and R_5' is selected from the group consisting of cyano,



AlK is alkyl of 1 to 4 carbon atoms, the double bond in the 1-position of the vinyl side chain of formula (A) having (E) or (Z) configuration, R_6 is selected from the group consisting of hydrogen, alkyl of 1 to 4 carbon atoms and alkoxycarbonyl of 2 to 5 carbon atoms, the substituents on the cyclopropane ring of formula (A) and (C) have the cis or trans, racemic or optically active configuration, Z_1 is alkyl of 1 to 4 carbon atoms, Z_2, Z_3 and Z_4 are individually selected from the group consisting of hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms and halogen and the asymetric carbon of formula (D) may be (S) or (R) configuration or a racemic mixture thereof and the carbon atom in the 1-position of the alcohol moiety may have (R), (S) or racemic configuration.

16. Animal feed containing an acaricidally effective amount of at least one compound of claim **1**.

17. A method of killing insects comprising contacting insects with an insecticidally effective amount of at least one compound of claim **1**.

24. A method of combatting acariens comprising contacting acariens with an acaricidally effective amount of at least one compound of claim **1**.

26. A method of combatting nematodes comprising contacting nematodes with nematocidally effective amount of at least one compound of claim **1**.

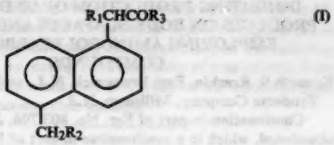
4,356,188

1-NAPHTHYL-ACETIC ACID DERIVATIVES AND THEIR THERAPEUTIC APPLICATIONS

Henri Pacheco, Lyons; Marie-Ange Descours-Saint-Martino, Villeurbanne; Demetre Yavordios, Chatillon, Chalaronne, and Jean Koeberle, Villars les Dombes, all of France, assignors to Institut de Recherche Scientifique "I.R.S.", Chatillon sur Chalaronne, France

Continuation-in-part of Ser. No. 6,511, Jan. 25, 1979, abandoned. This application Jul. 28, 1980, Ser. No. 173,171
Claims priority, application France, Feb. 2, 1978, 78 02932
Int. Cl.³ A61K *31/19, 31/215;* **C07C** *57/40, 69/616*
U.S. Cl. 434—317 **6 Claims**

1. A compound selected from the group consisting of 1-naphthyl-acetic acid derivatives of the formula:



(I)

in which:

R_1 is selected from the group consisting of hydrogen and straight- and branched-chain C_{1-6} alkyl groups,

R_2 is selected from the group consisting of straight- and branched-chain alkyl groups having 3–12 carbon atoms,

R_3 is selected from the group consisting of hydroxy, C_{1-6} straight- and branched-chain alkoxy radicals and the pharmaceutically acceptable salt of acids of the formula (I).

4. A method for treating a host with a therapeutic composition having anti-inflammatory, anti-pyretic, analgesic and non-ulcerogenic activities, comprising administering to said host an effective amount of a compound selected from the group consisting of 1-naphthyl-acetic acid derivatives of the formula:

(I)

in which:

R_1 is selected from the group consisting of hydrogen and straight- and branched chain C_{1-6} alkyl groups,

R_2 is selected from the group consisting of straight- and branched-chain alkyl groups having 1–12 carbon atoms,

R_3 is selected from the group consisting of hydroxy, C_{1-6} straight- and branched-chain alkoxy groups, and the pharmaceutically acceptable salt of acids of the formula (I).

5. A therapeutic composition having anti-inflammatory, anti-pyretic, analgesic and non-ulcerogenic activities, comprising an effective amount of a compound selected from the group consisting of [5-isobutyl-1-naphthyl]acetic acid and its pharmaceutically acceptable salts, together with a pharmaceutically acceptable excipient.

4,356,189

CHEMICAL CASTRATION

Charles M. Stagg, St. Joseph, and Ronald L. Tribble, Savannah, both of Mo., assignors to Philips, Roxane, Inc., St. Joseph, Mo.

Continuation of Ser. No. 29,637, Apr. 13, 1979, abandoned. This application Feb. 17, 1981, Ser. No. 235,326
Int. Cl.³ A61K *31/19*
U.S. Cl. 424—317 **10 Claims**

1. A method of chemically castrating male mammals of the feline, canine, equine, bovine, ovine and porcine species of mammals comprising injecting into both testes or into both spermatic cords of said mammals a castratingly effective amount of lactic acid.

4,356,190
INHIBITING PRODUCTION OF UNDESIRABLE PRODUCTS ON BODY SURFACES AND ENVIRONS EMPLOYING AMINOPOLYCARBOXYLIC COMPOUNDS

Kenneth S. Kraskin, East Brunswick, N.J., assignor to Personal Products Company, Milltown, N.J.

Continuation-in-part of Ser. No. 803,706, Jun. 6, 1977, abandoned, which is a continuation-in-part of Ser. No. 574,488, May 5, 1975, abandoned, which is a continuation-in-part of Ser. No. 478,622, Jun. 2, 1974, Pat. No. 3,920,020. This application Oct. 16, 1978, Ser. No. 351,919

The portion of the term of this patent subsequent to Jun. 16, 1998, has been disclaimed.

Int. Cl.³ A61K *31/195*

U.S. Cl. 424—319 **29 Claims**

1. A method of inhibiting the formation of fatty acids having from 4 to 18 carbon atoms per molecule from the degradation of skin secretions by Corynebacterium comprising applying to the skin, in an amount effective to inhibit the formation of said fatty acids, a composition comprising a carrier suitable for topical application and, as the sole essential ingredient, an aminopolycarboxylic compound selected from the group consisting of ethylenediaminetetraacetic acid, diethylenetriaminepentaacetic acid, N-hydroxyethylethylenediaminetriaacetic acid, triethylenetetraaminehexaacetic acid, 1,2-diaminocyclohexane-N,N'-tetraacetic acid, N,N-dihydroxyethylethylenediaminediacetic acid, iminodiacetic acid, hydroxyethyliminodiacetic acid, nitrilotriacetic acid and their water soluble salts; said aminopolycarboxylic compound being present in a concentration of 0.5 to 10 weight percent in said composition, based on the weight of the free acid, said composition maintaining the viability of said Corynebacterium.

4,356,191
ANIMAL FEED AND PROCESS

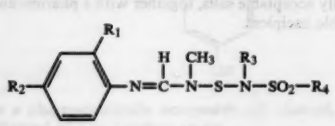
Melvin J. DeGeeter, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Jun. 3, 1981, Ser. No. 270,075

Int. Cl.³ A61K *31/18, 31/275*

U.S. Cl. 424—321 **4 Claims**

1. A process for obtaining increased meat, milk, egg, or wool production in healthy animals comprising the daily feeding of an effective amount of a compound of the formula



Formula I

or a pharmacologically acceptable acid addition salt thereof wherein R_1 is chloro, bromo, or alkyl of 1 through 4 carbon atoms; R_2 is hydrogen, chloro, bromo, or alkyl of 1 through 4 carbon atoms; R_3 is (1) alkyl of 1 through 8 carbon atoms, (2) cycloalkyl of 5 through 8 carbon atoms, (3) phenalky wherein alkyl is 1 or 2 methylene units in length, or (4) phenyl when the phenyl is unsubstituted or substituted with 1 through 3 substituents selected from the group consisting of methyl, chloro, bromo, nitro, trifluoromethyl, alkoxy of 1 or 2 carbon atoms, and cyano, and R_4 is (1) alkyl of 1 through 4 carbon atoms, (2) phenalkyl wherein alkyl is 1 or 2 methylene units in length and where the phenyl is unsubstituted or substituted with 1 through 3 substituents selected from the group consisting of methyl, chloro, bromo, nito, trifluoromethyl, alkoxy of 1 or 2 carbon atoms, and cyano, or (3) phenyl where the phenyl is unsubstituted or substituted with a substituent selected from the group consisting of methyl, chloro, and bromo in association with the animal's feed, water, salt ration, or pharmacologically acceptable carrier.

4,356,192
ANIMAL FEED AND PROCESS

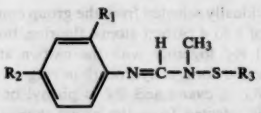
Melvin J. DeGeeter, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Jun. 3, 1981, Ser. No. 270,070

Int. Cl.³ A61K *31/155*

U.S. Cl. 424—326 **4 Claims**

1. A process for obtaining increased meat, milk, egg or wool production in healthy animals comprising the daily feeding of an effective amount of a compound of the formula:



Formula I

or a pharmacologically acceptable acid addition salt thereof wherein R_1 is lower alkyl of from 1 to 4 carbon atoms, inclusive, R_2 is selected from hydrogen, halogen and lower alkyl of from 1 to 4 carbon atoms, inclusive, and R_3 is selected from lower alkyl of from 1 to 4 carbon atoms, inclusive, phenyl, halogen-substituted phenyl, lower alkyl of from 1 to 4 carbon atoms, inclusive, -substituted phenyl, lower alkoxy of from 1 to 4 carbon atoms, -substituted phenyl and halogen-substituted lower alkyl of from 1 to 4 carbon atoms, inclusive, in association with the animal's feed, water, salt ration, or pharmacologically acceptable carrier.

4,356,193
ANIMAL FEED AND PROCESS

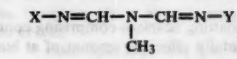
Melvin J. DeGeeter, Kalamazzo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Jun. 3, 1981, Ser. No. 270,071

Int. Cl.³ A61K *31/155, 31/135*

U.S. Cl. 424—326 **4 Claims**

1. A process for obtaining increased meat, milk, egg, or wool production in healthy animals comprising the daily feeding of an effective amount of a compound of the formula



Formula I

wherein X and Y, which may be identical or different, are 2,3-dimethylphenyl, 2,4-dimethylphenyl, 2,6-dimethylphenyl, 2,4,6-trimethylphenyl, 2,4,5-trimethylphenyl, 2,3,4-trimethylphenyl, 2-methyl-4-halophenyl, 2-ethyl-4-halophenyl, 2-halo-4-methylphenyl, 2-halo-4,6-dimethylphenyl, 2,4-dihalo-6-methylphenyl, 2-methyl-4-methoxyphenyl, phenyl or methylphenyl, provided that (a) when X and Y are identical, they are not phenyl or methylphenyl and (b) when X and Y are different, at least one of them is 2,3-dimethylphenyl, 2,4-dimethylphenyl, 2,4,6-trimethylphenyl, 2,3,4-trimethylphenyl, 2-methyl-4-halophenyl or 2-halo-4-methylphenyl or pharmacologically acceptable acid addition salt thereof in association with the animal's feed, water, salt ration, or pharmacologically acceptable carrier.

4,356,194
ANIMAL FEED AND PROCESS

Melvin J. DeGeeter, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

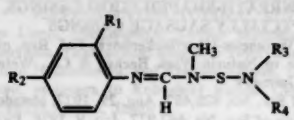
Filed Jun. 3, 1981, Ser. No. 270,069

Int. Cl.³ A61K *31/155, 27/00, 31/445, 31/495*

U.S. Cl. 424—326 **4 Claims**

1. A process for obtaining increased meat, milk, egg, or wool production in healthy animals comprising the daily feeding of an effective amount of a compound of the formula

Formula I



or a pharmacologically acceptable acid addition salt thereof, wherein R_1 is lower alkyl of from 1 to 4 carbon atoms; R_2 is hydrogen, halogen, or lower alkyl of from 1 to 4 carbon atoms; R_3 and R_4 are the same or different and are hydrogen, alkyl of 1 to 8 carbon atoms, inclusive; haloalkyl, arylalkyl and

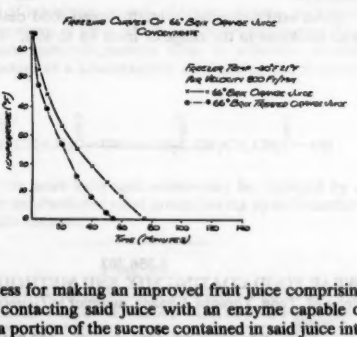
wherein alkyl is from 1 to 4 carbon atoms, cycloalkyl of from 3 to 6 carbon atoms, or aryl, and R_3 and R_4 taken together with —N= are a member selected from the group piperidine, morpholine, pyrazole, tribromopyrazole, N-methylpiperazine, pyrrole, pyrrolidine, pyrrolidone in association with the animal's feed, water, salt ration, or pharmacologically acceptable carrier.

4,356,195

FRUIT JUICES HAVING A DEPRESSED FREEZING POINT

Marvin L. Kahn, Williamsville, and John S. O'Mahony, Amherst, both of N.Y., assignors to Rich Products Corporation, Buffalo, N.Y.

Filed Jul. 14, 1980, Ser. No. 168,903
Int. Cl.³ A23L *2/00, 2/02;* C12P *19/02, 19/24*
U.S. Cl. 426—51 20 Claims


Freeze Curves Of 66° Brix Orange Juice Concentrate
Freezer Temp -40°F ±1°F
Air Velocity 800 Ft/Min
66° Brix Orange Juice
66° Brix Reamed Orange Juice
Concentrate (%)
Time (Minutes)

1. A process for making an improved fruit juice comprising the step of contacting said juice with an enzyme capable of converting a portion of the sucrose contained in said juice into fructose and glucose, said contacting being carried out under conditions suitable to effect said conversion, wherein said improved fruit juice has a water content of about 35% to about 65%, sugar in a ratio to water of about 0.8–2.0:1 and a water activity of below about 0.90.

4,356,196

PROCESS FOR TREATING ALFALFA AND OTHER CELLULOSIC AGRICULTURAL CROPS

Joe H. Hultquist, 616 Dockside Cove, Hastings, Nebr. 68901

Filed Oct. 20, 1980, Ser. No. 198,712
Int. Cl.³ A23K *1/22*
U.S. Cl. 426—69 4 Claims

1. A process for enhancing the cellulose digestibility and true protein availability of alfalfa to enhance the alfalfa as a feed for both ruminants and monogastric animals, said process comprising applying ammonia to the alfalfa for a time period less than about one hour at a treatment pressure in the range of about two atmospheres to about forty atmospheres and at a treatment temperature in the range of about 10° C. to about 85° C. to effect alternation of the cellulose-lignin configuration in said alfalfa, thereby increasing the digestibility of the cellulose in the alfalfa and increasing the availability of true protein from the fibers and from within the cell walls of the alfalfa to both ruminants and monogastric animals.

4,356,197

EDIBLE OIL

Michael T. Devitt, Brentwood, and John B. Rossell, Loughton, both of England, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 19,067, Mar. 9, 1979, abandoned. This application Feb. 9, 1981, Ser. No. 232,799
Claims priority, application United Kingdom, Mar. 14, 1978, 10096/78
Int. Cl.³ A23B *7/16*
U.S. Cl. 426—89 4 Claims

1. A method of preserving foodstuffs by applying an inert coating thereto said coating consisting essentially of a hydrogenated jojoba oil product applied in the form of a liquid at temperatures below 25° C. wherein said product comprises jojoba oil hydrogenated with a fresh nickel catalyst at a hydrogenation temperature below 125° C. to an iodine value of at least 60 and a trans content below 20; which exhibits an oxidative stability providing from 1 to 20 mm Hg pressure drop by an Accelerated Induction Period Test in 20 hours at 100° C. measured at about 1 atmosphere pressure; and which is a liquid remaining clear for at least 24 hours at 20° C.

4,356,198

METHOD OF PREPARING A BINDER FOR TABLETED GASIFIED CANDY

Maya Parada, Brooklyn, N.Y., and Marvin J. Rudolph, Bethel, Conn., assignors to General Foods Corporation, White Plains, N.Y.

Division of Ser. No. 88,481, Oct. 26, 1979, Pat. No. 4,263,328. This application Aug. 7, 1980, Ser. No. 176,055
Int. Cl.³ A23G *3/00*
U.S. Cl. 426—96 3 Claims

1. A method of preparing an excipient binder, which binder consists of dextrose and starch, for use in tableting finely divided gasified candy, which method comprises the steps of:

(a) heating an aqueous solution of starch at an elevated temperature and for a sufficient period of time to hydrolyze said starch;

(b) coating finely divided dextrose with a film of the starch solution of step (a), so that the starch-coated dextrose is about 2.0–4.0% starch, by weight; and

(c) drying the starch-coated dextrose to a moisture level of less than about 3.0 wt%.

4,356,199

TUBULAR PACKAGING MATERIAL AND METHOD FOR ITS MANUFACTURE

Klaus-Dieter Hammer, Mainz; Wolfgang Heinrich, Salach; Guenter Gerigk, Oberursel, and Max Bytzek, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 4, 1981, Ser. No. 290,059
Claims priority, application Fed. Rep. of Germany, Aug. 8, 1980, 3030035
Int. Cl.³ F16L *11/00;* B65D *81/34;* B05D *3/12;* A23G *1/00*
U.S. Cl. 426—105 18 Claims

1. A water-permeable tubular packaging material, consisting essentially of a carrier tubing comprised of cellulose hydrate and containing in its wall from about 5 to 12% by weight of water and from about 18 to 28% by weight of a plasticizer for cellulose hydrate, in each instance relative to the total weight of the carrier tubing; and

a coating on the inside and on the outside of said carrier

tubing of a water-insoluble, heat-cured synthetic condensation product comprised of urea/formaldehyde, formaldehyde/melamine, epichlorohydrin/polyamine or epichlorohydrin/polyamine/polyamide, wherein the carrier tubing is characterized by a swelling value in the range from about 80 to 120%, and the tubular packaging, after soaking in water at a temperature between about 40° to 50° C. for a period of about 30 minutes and subsequent cooling to about room temperature, is characterized by dimensions in the wet state which are 2 to 6% greater than those before said soaking in water.

4,356,200

TUBULAR PACKAGING MATERIAL AND METHOD FOR ITS MANUFACTURE

Klaus-Dieter Hammer, Mainz; Wolfgang Heinrich, Salach; Guenter Gerigk, Oberursel, and Max Bytzek, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 4, 1981, Ser. No. 290,054

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1980, 3030036

Int. Cl.³ F16L *11/00;* **B65D** *81/34;* **B05D** *3/12;* **A23G** *1/00*

U.S. Cl. 426—105 **21 Claims**

1. A tubular packaging material, comprising:

a carrier tubing comprised of cellulose hydrate and containing in its wall from about 5 to 12% by weight of water and from about 18 to 28% by weight of a plasticizer for cellulose hydrate, in each instance relative to the total weight of the carrier tubing;

an anchoring layer on the outside of said carrier tubing of a water-insoluble heat-cured synthetic condensation product;

a film coating on the outside of said carrier tubing which is substantially impermeable to water and water vapor and which comprises a copolymer of vinylidene chloride; and

a water-permeable adhesion-promoting layer on the inside surface of said carrier tubing, comprising a water-insoluble, heat-cured condensation product, wherein the carrier tubing is characterized by a swelling value in the range from about 80 to 120%, and the tubular packaging, after soaking in water at a temperature between about 40° to 50° C. for a period of about 30 minutes and subsequent cooling to about room temperature, is characterized by dimensions in the wet state which are about 2 to 6% greater than those before said soaking in water, and wherein the tubular packaging, after simmering or boiling at a temperature of about 85° C. for about 30 minutes and then cooling to room temperature, is characterized by dimensions in the wet state which are about 1 to 3% smaller than the wet state dimensions of the tubular packaging material which has only been subjected to said soaking in water.

18. A sausage casing comprising the tubular packaging material defined by claim 1.

19. A sausage casing as defined in claim 18, further comprising a sausage filling contained inside of said casing.

4,356,201

EDIBLE WREATH-SHAPED FOOD CASINGS, ESPECIALLY SAUSAGE CASINGS

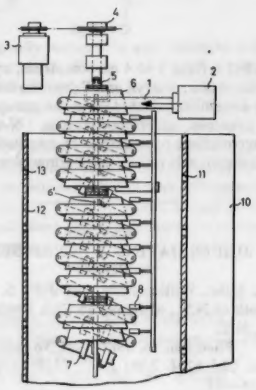
Bruno Winkler, Weinheim-Oberflockenbach, Fed. Rep. of Germany, assignor to Naturin-Werk Becker & Co., Weinheim, Fed. Rep. of Germany

Continuation of Ser. No. 828,487, Aug. 29, 1977, abandoned, which is a division of Ser. No. 647,977, Jan. 9, 1976, Pat. No. 4,081,562, which is a continuation-in-part of Ser. No. 452,333, Mar. 18, 1974, abandoned. This application Sep. 5, 1980, Ser. No. 184,191

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1973, 2314767

Int. Cl.³ A22C *13/00*

U.S. Cl. 426—138 **6 Claims**



1. An artificial edible wreath-shaped food casing having a wall thickness in the range of from 8μ to 40μ.

4,356,202

WRAP FOOD COATING MIX AND METHOD OF USING

John M. Todd, Toronto, Canada, assignor to General Foods Inc., Canada

Filed Oct. 19, 1981, Ser. No. 313,071

Int. Cl.³ A21D *13/00*

U.S. Cl. 426—138 **17 Claims**

12. A method of baking a foodstuff to impart thereto a fried appearance, taste and texture comprising:

enveloping said foodstuff in an edible coating and wrapping composition in a pliable sheet form said composition comprising an intimate admixture of a fat, water and particulate materials suspended in said pliable sheet form by a gelatin matrix said composition comprising from 0.5 to 40% gelatin by weight of the composition, said gelatin having a bloom strength of 50 or greater, from 25 to 75% farinaceous material by weight of the composition, from 2 to 30% fat by weight of the composition, and from 10 to 70% water by weight of the composition; and

baking said enveloped foodstuff for a time sufficient to cook said foodstuff and melt said gelatin and fat and impart to said foodstuff a fat-fried taste, texture and appearance.

4,356,203

PROCESS FOR PRODUCING CURED MEAT PRODUCTS HAVING ANTIBOTULINAL ACTIVITY

Ryuzo Ueno, Nishinomiya; Toshio Matsuda, Itami; Tatsuo Kanayama, Takarazuka; Kunihiko Tomiyasu; Yatsuka Fujita, both of Nishinomiya, and Kiyoshi Nagata, Takarazuka, all of Japan, assignors to Kabushiki Kaisha Ueno Seiyako Oyo Kenkyujo, Osaka, Japan

Continuation of Ser. No. 144,877, Apr. 29, 1980, abandoned.
This application Oct. 19, 1981, Ser. No. 312,817
Int. Cl.³ A23B 4/02, 4/12
U.S. Cl. 426—266 5 Claims

1. A process for producing cured meat products having antibotulinal activity comprising curing meat with a pickling composition comprising curing agents consisting essentially of sodium chloride, from 20 to 120 ppm, based on the weight of the meat, of a nitrite salt, and a polyphosphate salt curing agent, and an additive for reducing formation of N-nitrosopyrrolidine consisting essentially of from 300 to 600 ppm of at least one of ascorbic acid or its salt and erythorbic acid or its salt, wherein said pickling composition is divided into a first preparation containing all of the nitrite salt and a second preparation containing all of said additive, said first and second preparations being separately added to the meat under conditions such that the nitrite salt reacts with protein or myoglobin in the meat but does not react with the additive, whereby decomposition of the additive, due to reaction with the nitrite salt, and formation of mutagenic substances, are prevented.

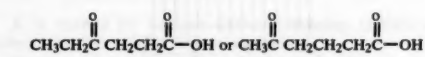
4,356,204

COMPOUND AND METHOD FOR INHIBITING GROWTH OF SPOILAGE ORGANISMS

Michael C. Robach, St. Peters, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 3, 1981, Ser. No. 289,570
Int. Cl.³ A23L 3/34
U.S. Cl. 426—321 14 Claims

1. Method of inhibiting growth of food poisoning and spoilage microorganisms in food which comprises contacting food containing said mircroorganisms with an effective growth inhibiting amount of a ketohexanoic acid having the formula



wherein one or more hydrogen atoms may be replaced by a substituted or unsubstituted alkyl group having up to 10 carbon atoms and salts thereof.

4,356,205

METHOD AND APPARATUS FOR CUTTING CONTROLLED-VOLUME MEAT PORTIONS FROM A SEGMENT OF FRESH WHOLE-MUSCLE MEAT

Louis R. Richards, Mokena, Ill., assignor to Formax, Inc., Mokena, Ill.

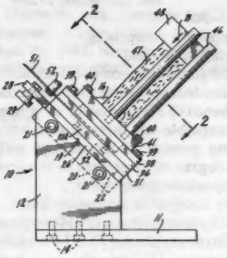
Filed Oct. 24, 1980, Ser. No. 200,604
Int. Cl.³ A22C 7/00; B29C 15/00; B29D 7/18
U.S. Cl. 426—518 10 Claims

1. The method of cutting successive controlled-volume meat portions from the face of a segment of fresh whole-muscle meat, comprising the following steps:

A. advancing a fresh whole-muscle meat segment along a given meat advancement path transverse to the face of the meat segment, into firm engagement with a stop plate, without appreciable constraint on the cross-sectional configuration of the meat segment;

B. constraining only the face part of the meat segment, immediately adjacent the stop plate in a direction parallel to the face of the meat segment, in a shaping clamp of given thickness and of a given cross-sectional shape generally corresponding to the natural cross-sectional shape of the meat segment, thereby constraining a predetermined volume of the meat in the shaping clamp, without constraint of the remainder of the meat segment;

C. cutting off the face part of the meat segment, immediately behind the shaping clamp, while still under constraint, to form a controlled-volume meat portion in the shaping clamp;



D. removing the controlled-volume meat portion from the shaping clamp; and

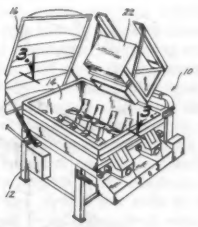
repeating steps A through D to form additional controlled-volume meat portions, cut from the same meat segment.

4,356,206

METHOD OF MASSAGING MEAT PRODUCTS

Wesley H. Boldt, 230 Thornton Ave., Des Moines, Iowa 50321

Filed Feb. 4, 1981, Ser. No. 231,387
Int. Cl.³ A23P 1/00
U.S. Cl. 426—519 1 Claim



1. The method of massaging meat products, comprising,

placing meat products in a chamber having at least a pair of horizontal shafts therein with a plurality of paddle elements thereon, said paddle elements being helically disposed in a longitudinal direction on said shafts and being substantially flat with generally smooth and arcuate perimeter edges,

rotating said shafts in opposite directions at a speed of 9 to 18 revolutions per minute to move the paddles dwelling in a position between said shafts in an upward direction and to massage said meat products with said paddles,

and subjecting said chamber to vacuum conditions continuously while said shafts are rotating for a period of time sufficient to cause the muscles of the meat to expand which along with the massaging of the meat causes protein contained therein to extrude to the surface of the meat whereby the meat products subsequently adhered to each other.

4,356,207
SWEETENING WITH 5-(DIHYDROXYPHENOXY) TETRAZOLES

William L. Garbrecht, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 123,859, Feb. 22, 1980, Pat. No. 4,309,446. This application Jul. 6, 1981, Ser. No. 280,661
Int. Cl.³ A23L *1/236*
U.S. Cl. 426—548 15 Claims

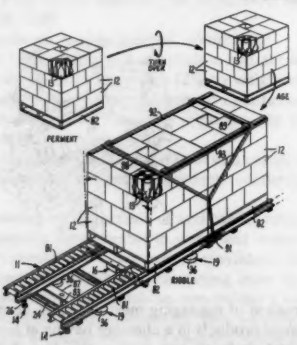
4. A composition comprising
a. a flavoring agent and
b. 5-(2,3-dihydroxyphenoxy)-1H-tetrazole, or a mixture of 5-(2,3-dihydroxyphenoxy)-1H-tetrazole and 5-(2,6-dihydroxyphenoxy)-1H-tetrazole, or a non-toxic, physiologically acceptable salt thereof, said compound, mixture, or salt being present in an amount sufficient to impart a desired degree of sweetness to the composition.

15. A composition comprising
a. an orally acceptable substance, and
b. 5-(2,3-dihydroxyphenoxy)-1H-tetrazole, or a mixture of 5-(2,3-dihydroxyphenoxy)-1H-tetrazole and 5-(2,6-dihydroxyphenoxy)-1H-tetrazole, or a non-toxic, physiologically acceptable salt thereof, said compound, mixture, or salt being in an amount sufficient to impart a desired degree of sweetness to the composition.

4,356,208
METHOD AND APPARATUS FOR RIDDLING BOTTLED WINES IN CASES

David W. Williams, Bakersfield; James L. Jordan, Guerneville, and James E. Huntsinger, Windsor, all of Calif., assignors to F. Korbel and Bros., Guerneville, Calif.

Continuation of Ser. No. 890,305, Mar. 27, 1978, Pat. No. 4,235,940. This application May 19, 1980, Ser. No. 151,129
The portion of the term of this patent subsequent to Nov. 25, 1997, has been disclaimed.
Int. Cl.³ C12G *2/00*
U.S. Cl. 426—592 40 Claims



1. The method of riddling bottled wine, comprising
placing a bottle of wine in a compartment having walls spaced apart slightly farther than the diameter of said bottle,
inverting said bottle whereby it rests on its mouth end,
and causing the upper end of said bottle to shift rapidly from one side of said compartment to the other so as to impart an impact to said bottle sufficient to dislodge solids in the wine adherent to said bottle.

31. In an apparatus for riddling bottled wine having a supporting member formed for shifting rapidly with a lateral component of motion,
a bottle of wine having solids in the wine,
walls defining a rectangular compartment carried on said supporting member for movement therewith and having a height slightly exceeding the height of the bottle of wine to be riddled and lateral dimensions slightly exceeding the major diameter of said bottles,
said compartment also being defined by a floor adapted to receive and support the capped mouth end of said bottle whereby the upper end of said bottle is free to shift rapidly from one wall of said compartment to the opposite wall in response to rapid movement of the compartment with a lateral component of motion.

4,356,209
FOOD COLORING AND FLAVORING AGENT FROM DEFATTED WHEAT GERM

Hugh D. Bryan, Savoy; Judy A. Carter, Champaign, and Donald B. Trimble, Monticello, all of Ill., assignors to A. H. Robins Company, Inc., Richmond, Va.

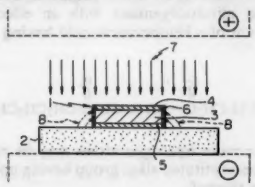
Filed Oct. 16, 1978, Ser. No. 952,508
Int. Cl.³ A23G *1/00*
U.S. Cl. 426—627 1 Claim

1. An extended cocoa powder comprising cocoa and a defatted wheat germ having up to about 2% by weight of fat content having been toasted to a medium to dark color and having a corresponding mild to strong cocoa taste.

4,356,210
METHOD FOR FORMING A PROTECTING FILM ON SIDE WALLS OF A SEMICONDUCTOR DEVICE

Hajime Imai, Tokyo; Masahiro Morimoto, Yokohama, and Takao Fujiwara, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Continuation of Ser. No. 62,415, Jul. 30, 1979, abandoned. This application Jan. 7, 1981, Ser. No. 223,152
Claims priority, application Japan, Jul. 29, 1978, 53-92777; Dec. 1, 1978, 53-148838
Int. Cl.³ B05D *3/06;* C23C *17/00*
U.S. Cl. 427—38 21 Claims



1. A method for forming a protecting film on the side walls of a plurality of semiconductor devices, said protecting film comprising at least one protecting layer formed on one of said side walls and a plural pre-determined number of protecting layers on the opposite side wall, said method comprising the steps of:
forming a plurality of belt-shaped electrodes on at least one surface of a semiconductor substrate aligned in parallel with a cleavage direction of said semiconductor substrate;
cleaving said substrate along said cleavage direction into a plurality of two-bar portions, each said two-bar portion having at least two of said belt-shaped electrodes which are not located oppositely to each other on the opposite surfaces of said semiconductor substrate,
placing said two-bar portions on the surface of a first substrate target made of a first protecting layer material so that that the side walls of said substrate portions are oriented essentially perpendicularly to said substrate target;
placing said first substrate target with said two-bar portions in an atmosphere including energetic particles; and
impinging said energetic particles against said first substrate target, so that particles of said first protecting layer material are sputtered from said first substrate target and de-

posited on the exposed side walls of each said two-bar portion to form a first protecting layer;

re-cleaving in the same direction each of said two-bar portions into two bars each of which has at least one of said belt-shaped electrodes on a respective surface of said cleaved semiconductor substrate;

placing said bars on a second substrate target made of a second protecting layer material, and placing said second substrate target in an atmosphere including energetic particles;

impinging energetic particles against said second substrate target and said bars, so that particles of said second protecting layer material are emitted from said second substrate target and deposited on said first protecting film and on the newly exposed side walls of said bars to form a second protecting layer; and

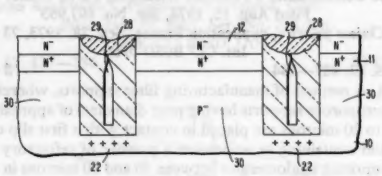
dividing in a direction perpendicular to said cleavage direction each of said bars into a plurality of said semiconductor devices.

4,356,211

FORMING AIR-DIELECTRIC ISOLATION REGIONS IN A MONOCRYSTALLINE SILICON SUBSTRATE BY DIFFERENTIAL OXIDATION OF POLYSILICON

Jacob Riseman, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 19, 1980, Ser. No. 218,155
Int. Cl.³ H01L *21/265, 21/308*
U.S. Cl. 427—85 **13 Claims**



1. A method for forming dielectric isolation regions in a monocrystalline silicon substrate including:

forming a layered structure of silicon dioxide and silicon nitride over a surface of the substrate;

forming trenches having substantially vertical walls in the layered structure and the substrate where it is desired to form the isolation regions in the substrate;

forming a channel stopper at the bottom of each of the trenches;

forming a layer of silicon dioxide on each of the walls of each of the trenches in the substrate;

forming polycrystalline silicon on each of the substantially vertical walls of each of the trenches in the layered structure and the substrate so that the upper portion of the polycrystalline silicon on each of the substantially vertical walls of the trenches will oxidize at a rate substantially faster than the lower portion of the polycrystalline silicon on each of the substantially vertical walls of the trenches; and thermally oxidizing the polycrystalline silicon until the polycrystalline silicon oxidizes to close the upper end of each of the trenches while leaving an air space therebeneath to form the dielectric isolation region.

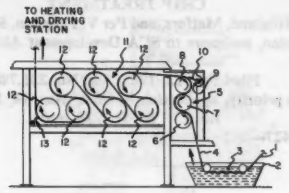
2. The method according to claim 1 including selectively doping the polycrystalline silicon so that the polycrystalline silicon on the portion of each of the substantially vertical walls of the trenches in the layered structure is doped heavier than the polycrystalline silicon on the portion of each of the substantially vertical walls of the trenches in the substrate so that the polycrystalline silicon on the portion of each of the substantially vertical walls of the trenches in the layered structure oxidizes at least twice as fast as the polycrystalline silicon on the portions of each of the substantially vertical walls of the trenches in the substrate.

4,356,212

METHOD AND APPARATUS FOR TREATING TEXTILE CORD

Willie M. Stafford, Hartselle, Ala., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 20, 1981, Ser. No. 255,961
Int. Cl.³ B05D *3/12*; B05C *3/152, 11/10*
U.S. Cl. 427—175 **2 Claims**



1. In an apparatus for treating a plurality of individual cords of textile material as they move, under tension, in spaced apart relationship along a predetermined path which comprises, sequentially along said path, (A) a means for applying an aqueous solution, or mixture, of adhesive to said cords, (B) a squeeze roll station composed of at least two rotating cylindrical rolls with horizontal axes positioned in a substantially vertical plane relative to each other around which said cords pass in a substantially serpentine path on a single pass basis and in the same direction as the rotation of the roll around which they are passing, where at least two adjacent rolls rotate in opposite directions and are positioned so that they press cords between them to remove a substantial amount of said aqueous solution or mixture from the cords, (C) a pull roll station composed of at least two spaced apart rotating cylindrical pull rolls, where at least two adjacent pull rolls rotate in opposite directions, around which said cords pass in a substantially serpentine path on a single pass basis in the same direction as the rotation of the roll about which they are passing and (D) a station for heating and drying said cord; the improvement in which a first rigidly contained elastomeric rubber squeege bar is loosely positioned to lightly contact the breadth of the cords on the ascending surface of at least one of said squeeze rolls to affect a degree of liquid removal from the cords and a second rigidly contained elastomeric rubber squeege is loosely positioned to lightly contact the breadth of the cords on the ascending surface of at least one of said pull rolls to affect a degree of removal of foamed liquid or material which may have formed on the cord in the pull roll station.

2. In a method of treating a plurality of individual cords of textile material as they move, under tension, in spaced apart relationship along a predetermined path which comprises sequentially along said path, (A) applying an aqueous solution or mixture of adhesive to said cords, (B) treating said cords in a in a squeeze roll station composed of at least two rotating cylindrical rolls having horizontal axes positioned in a substantially vertical plane relative to each other around which said cords pass in a substantially serpentine path on a single pass basis and in the same direction as the rotation of the roll around which they are passing, where at least two adjacent rolls rotate in opposite directions and are positioned so that they press cords between them to remove a substantial amount of said aqueous solution or mixture from the cords, (C) then treating the cords in a pull roll station composed of at least two spaced apart rotating cylindrical pull rolls, where at least two adjacent pull rolls rotate in opposite directions, around which said cords pass in a substantially serpentine path on a single pass basis in the same direction as the rotation of the roll about which they are passing and (D) drying the cord by heating; the improvement in which liquid is additionally removed from the cord in

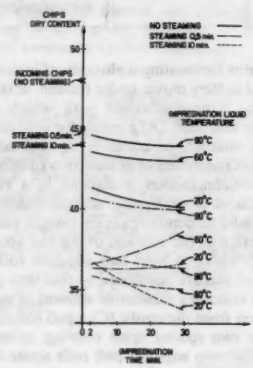
the squeeze roll station by a first rigidly contained elastomeric rubber squeege which is loosely positioned to lightly contact the breadth of the cords on the ascending surface of the upper half of at least one squeeze roll and in which foamed liquid or material which may have formed on the cord in the pull roll station is removed in said pull roll station by a second rigidly contained elastomeric rubber squeege loosely positioned to lightly contact the breadth of the cords on the ascending surface of the upper half of at least one pull roll.

4,356,213

CHIP TREATMENT

Hans E. Höglund, Matfors, and Per V. Peterson, Sundsvall, both of Sweden, assignors to SCA Development Aktiebolag, Sweden

Filed Feb. 23, 1981, Ser. No. 236,788
Claims priority, application Sweden, Mar. 14, 1980, 8002015
Int. Cl.³ B05D *1/18, 3/04*
U.S. Cl. 427—212 **8 Claims**



1. A method of treating wood chips in the manufacture of pulp therefrom, comprising the steps of, impregnating said wood chips with an impregnation liquid to cause the cavities within said wood chips to fill with said impregnation liquid, said impregnation liquid including a compound selected from the group consisting of sodium sulphite, sodium hydroxide and sodium hydrogen sulphite, draining said impregnated wood chips, and washing said wood chips with a wash solution whereby said wood chips are prevented from absorbing said wash solution by the presence of a portion of said impregnation liquid remaining within the caviites of said wood chips.

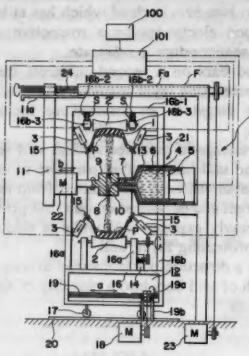
4,356,214

METHOD OF FORMING PUNCTURE PREVENTING LAYER FOR TIRE AND APPARATUS EMPLOYED THEREFOR

Kozi Soeda, Nishinomiya; Katuyuki Hoshikawa, Nyogo, and Akitaka Kimura, Kobe, all of Japan, assignors to Sumitomo Rubber Industries, Ltd., Japan

Continuation of Ser. No. 81,458, Oct. 3, 1979, Pat. No. 4,262,624, which is a division of Ser. No. 865,133, Dec. 28, 1977, abandoned. This application Dec. 31, 1980, Ser. No. 221,775
Claims priority, application Japan, Dec. 30, 1976, 51/158497
Int. Cl.³ B05D *1/02*
U.S. Cl. 427—233 **8 Claims**

1. A process for coating the inner surface of a pneumatic tire having a radial inner open side with a puncture sealing material having a high viscosity which comprises extruding a stream of said sealing material while at said high viscosity against a flat face of a first disk disposed facing a second disk spaced upstream therefrom, rotating said first disk relative to the second disk while the space between spaced peripheral edges of the disks is disposed opposite said open side of the tire until said stream of high viscosity material is cast by the flat face as a



spray through the open side of the tire and is spread over said inner surface of the tire to form a puncture sealing coating.

4,356,215

METHOD OF MANUFACTURING SUPPORTS FOR POROUS FILTERS

Alain Auriol, and Paul Tritten, both of Tarbes, France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Aug. 15, 1974, Ser. No. 497,953
Claims priority, application France, Sep. 28, 1973, 73 34827
Int. Cl.³ B05D *5/00*
U.S. Cl. 427—244 **3 Claims**

1. A method of manufacturing filter supports, wherein rigid macroporous supports having pore diameters of approximately 15 to 20 microns are placed in contact with a first slip coating liquid containing in suspension a powder of refractory oxides comprising agglomerates between 10 and 30 microns in diameter, the resulting deposited layer is dried by heating it to approximately 100° C., the layer is brushed so as to remove particles of powder which have not penetrated inside the pores, the resulting supports are placed in contact with a second slip coating liquid containing in suspension a powder of refractory oxides having a particle diameter between 1 and 8 microns, and the products obtained are heat-treated at approximately 1500° C.

4,356,216

PROCESS FOR PRODUCING STRIPED SURFACE COATINGS

J. Lynn Gailey, Newton Falls, and Carl A. Wollam, Cortland, both of Ohio, assignors to Alcan Aluminum Corporation, Cleveland, Ohio

Filed Jan. 21, 1981, Ser. No. 226,705
Int. Cl.³ B05D *5/00*
U.S. Cl. 427—286 **13 Claims**

1. In a process for applying a coating to a major surface of a strip article, including the steps of

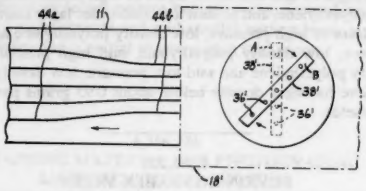
(a) continuously advancing the article longitudinally past a dam extending transversely of said major surface in adjacent spaced relation thereto while

(b) maintaining a body of a first liquid coating material in contact with said major surface immediately ahead of said dam for establishing a continuous wet coating layer on said major surface, and

(c) immediately beyond said dam, advancing the article longitudinally past a wall of extended length in the direction of article advance and facing said major surface while restraining the article against movement of said major surface away from said wall beyond a predetermined

distance equal to a desired thickness of said wet coating layer, such that said major surface and said wall mutually define a gap entirely filled by said wet coating layer across the width of said layer, the improvement which comprises

(d) through at least one aperture in said wall, spaced from



said dam in the direction of article advance, delivering at least a second liquid coating material to said gap under pressure sufficient to displace locally the first liquid coating material in the wet coating layer, thereby to establish a stripe of the second liquid coating material in said coating layer.

4,356,217

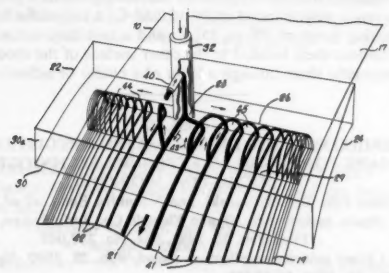
PROCESS FOR PRODUCING STRIATED SURFACE COATINGS

Carl A. Wollam, Cortland; J. Lynn Gailey, Newton Falls, and Alexander A. Chalmers, Warren, all of Ohio, assignors to Alcan Aluminum Corporation, Cleveland, Ohio

Filed Jan. 21, 1981, Ser. No. 226,706

Int. Cl.³ B05D *5/00*

U.S. Cl. 427—286 **13 Claims**



1. A process for producing a longitudinally striated coating on a major surface of an elongated strip article, comprising

(a) continuously advancing the article lengthwise past an open long side of an otherwise enclosed elongated trench extending transversely of the article with said major article surface disposed in facing proximate relation to said open trench side to constitute a moving wall closing said open side, while

(b) continuously delivering at least two liquid coating materials to the trench under pressure for providing concurrent laminar flows of the two materials in contact with each other along a common path, at least at one locality in a long side of the trench, such that both materials flow within the trench from said one locality in at least one common direction lengthwise of the trench, and for maintaining the trench continuously entirely filled with the liquid coating materials, thereby to deposit a continuous coating layer on said major surface through said open side, said two liquid coating materials being circulated within the trench by motion of said major surface so as to be distributed in said coating layer in alternating longitudinal striations.

4,356,218

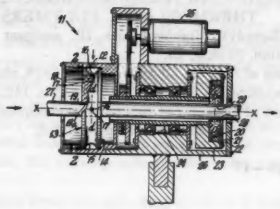
LIQUID COATING METHOD AND APPARATUS

Herman S. Chiu, Chicago, and Keith A. Watts, Western Springs, both of Ill., assignors to Union Carbide Corporation, Danbury, Conn.

Filed May 7, 1981, Ser. No. 261,457

Int. Cl.³ A21D *13/00;* **A23L** *1/27;* **B05D** *3/12;* **C12C** *5/04*

U.S. Cl. 427—355 **29 Claims**



21. A method for coating the exterior wall of a longitudinally moving inflated flexible tubing with liquid comprising the steps of:

(a) continuously moving the inflated flexible tubing in the longitudinal direction along a straight line;

(b) providing first flexible and resilient means with an inner circular opening of slightly smaller diameter than the diameter of the inflated tubing exterior wall;

(c) supplying liquid to said inner circular opening of the first means;

(d) moving said inflated tubing through said inner circular opening of said first means and maintaining rubbing contact with the opening edge so as to displace said opening edge and simultaneously apply said liquid to, and distribute the applied liquid around, the inflated tubing exterior wall;

(e) providing second flexible and resilient means with an inner circular opening of slightly smaller diameter than the diameter of the inflated tubing exterior wall;

(f) rotating said second means around its centerline axis; and

(g) moving said inflated tubing with said liquid applied on its exterior wall through the rotating second means inner circular opening and maintaining rubbing contact with the opening edge so as to displace said opening edge while simultaneously smoothing the liquid coating as a continuous film of substantially uniform thickness on the tubing exterior wall.

4,356,219

TREATED YARN, METHOD OF PREPARATION AND RUBBER/CORD COMPOSITE

Wyndham H. Boon, North Canton, Ohio, and Abdel-Hadi Sid-Ahmed, Alpharetta, Ga., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 3, 1980, Ser. No. 212,302

Int. Cl.³ B05D *3/02;* **D02G** *3/02, 3/36*

U.S. Cl. 427—386 **7 Claims**

1. A method of preparing a drawn, coated polyester yarn which comprises (A) applying aqueous emulsion(s) of epoxy resin and spin finish fiber treatment oil to spun or drawn yarn as (i) the same emulsion or (ii) separate emulsions in either order or simultaneously so that the emulsions are at least partially intermixed on the surface of the yarn and either (B-1) drying the yarn if it has been previously drawn or (B-2) drawing the yarn if the emulsion(s) were applied to a spun (or undrawn) yarn, where said yarn is optionally in the form of a multiple of twisted or cabled drawn yarns to form a cord

thereof, and where said applied and dried coating thereon is comprised of, based on the yarn, the product of the mixture of (A) about 0.5 to about 1.5 weight percent of said spin-finish fiber treatment oil comprised of a mixture of (1) pentaerythritol tetraester (C_{12}–C_{14}) fatty acid, (2) polyoxy ethylene nonyl phenol and (3) oleyl diethyl imidazoleimium sulfate and (B) about 0.4 to about 1.5 weight percent of said epoxy resin having a melting point below about 75° C. and containing about 3 to about 9 weight percent 2-(β-dimethylamino ethoxy)-4-methyl-1,3,2-dioxaborinane based on said epoxy resin.

4,356,220

ARTIFICIAL TURF-LIKE PRODUCT OF THERMOPLASTIC POLYMERS

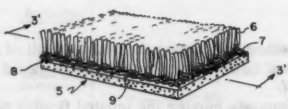
Joseph C. Benedyk, Highland Park, Ill., assignor to Brunswick Corporation, Skokie, Ill.

Continuation of Ser. No. 33,483, Apr. 26, 1979, abandoned. This application Jul. 10, 1980, Ser. No. 168,363

The portion of the term of this patent subsequent to Oct. 28, 1997, has been disclaimed.

Int. Cl.³ A41G *1/00*

U.S. Cl. 428—17 **18 Claims**



1. An artificial grass product, comprising: a pile fabric with yarn comprised of a plurality of fibers made of a polymeric material selected from the group consisting of copolymers of ethylene-vinyl acetate, ethylene-ethyl acrylate, ethylene-butylene, ethylene-propylene; polyvinyl chloride; chlorinated polyolefins; low density polyethylene; and mixtures thereof and having an elastic modulus of from 25,000 p.s.i. to 100,000 p.s.i. and a moment of inertia of from 1.06×10^{-10} in.^{4} to 8.33×10^{-9} in.^{4}, the fibers extending from and substantially perpendicular to a backing to which the fibers are secured, wherein the yarn is twisted at the point of emergence from the backing.

4,356,221

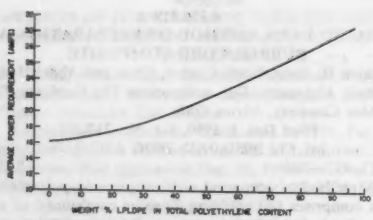
MELT-EXTRUDED MULTILAYER POLYETHYLENE BAG FILM

John Anthony, Downers Grove; Frank J. Velisek, Westmont, both of Ill., and Paul D. Capponi, Wayne, N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Filed May 15, 1981, Ser. No. 264,101

Int. Cl.³ B65D *31/00*; B32B *27/08*

U.S. Cl. 428—35 **18 Claims**



1. A melt-extruded multilayer polyethylene film consisting essentially of a first outer layer containing at least about 75 percent by weight, based on the weight of said first outer layer, of high pressure, low density polyethylene, and at least a second outer layer comprising a mixture of high pressure, low density polyethylene and low pressure, low density polyethylene, said high pressure, low density polyethylene and said low pressure, low density polyethylene having a density below about 0.93 grams per cubic centimeter.

17. A bag comprising a melt-extruded multilayer polyethylene film wherein said film consists essentially of a first outer layer containing at least about 75 percent by weight, based on the weight of said first outer layer, of high pressure, low density polyethylene, and at least a second outer layer comprising a mixture of high pressure, low density polyethylene and low pressure, low density polyethylene, said high pressure, low density polyethylene and said low pressure, low density polyethylene having a density below about 0.93 grams per cubic centimeter.

4,356,222

FUSION-BONDABLE SHEET

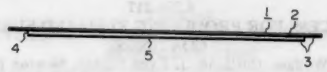
Hiroshi Harakawa; Youtaro Fujiwara; Masaaki Matsushita, and Seiko Tsutsui, all of Ichihara, Japan, assignors to Ube Industries, Ltd., Chiba, Japan

Filed Oct. 2, 1981, Ser. No. 308,089

Claims priority, application Japan, Oct. 7, 1980, 55-142274[U]

Int. Cl.³ B32B *3/14*

U.S. Cl. 428—78 **13 Claims**



1. A fusion-bondable sheet comprising a crosslinked polyolefin sheet, a fusion-bondable layer formed on one surface of the crosslinked polyolefin sheet, which layer is composed of a composition comprising as the main components a polyolefin having a melting point of 80° to 200° C., a polyolefin having a melting point of 30° to 75° C. and a tackifier, and a flame-retardant sheet bonded to the other surface of the crosslinked polyolefin sheet through a layer of a binder or adhesive.

4,356,223

SEMICONDUCTOR DEVICE HAVING A REGISTRATION MARK FOR USE IN AN EXPOSURE TECHNIQUE FOR MICRO-FINE WORKING

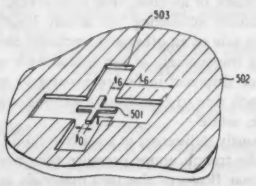
Yasuo Iida; Katumi Suzuki, and Nobuhiro Endo, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Feb. 23, 1981, Ser. No. 237,049

Claims priority, application Japan, Feb. 28, 1980, 55-24830; May 29, 1980, 55-71758

Int. Cl.³ B32B *3/00*; G01B *11/00*

U.S. Cl. 428—156 **19 Claims**



1. A semiconductor device comprising a semiconductor substrate, a device region formed along a major surface of said semiconductor substrate, and a chip registration mark formed along said major surface and positioned in a peripheral portion adjacent to said device region, said chip registration mark including a first registration pattern having a recess shape and a second registration pattern having a protrusion shape dis-

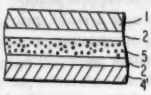
posed within said first registration pattern, said first and second registration patterns having straight edge lines, respectively, and said first and second registration patterns jointly forming a composite registration mark.

3. A registration mark for use in an exposure technique for micro-fine working, comprising two kinds of larger and smaller registration patterns on a substrate and superposed on each other, said larger pattern being a recess formed on the surface of said substrate and said smaller pattern being a protrusion formed at a partial region within said recess.

4,356,224
WRAPPING MATERIAL FOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Mutsuo Akao, and Tadashi Kawata, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 2, 1980, Ser. No. 155,290
Claims priority, application Japan, Jun. 1, 1979, 54-68379
Int. Cl.³ B32B *7/02, 5/16*
U.S. Cl. 428—220 **12 Claims**

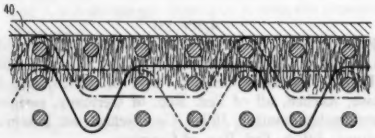


1. In a wrapping material for photographic light-sensitive materials, the improvement which comprises said wrapping material including a light-shielding resin layer, said layer being produced by extroding pellets of a mixture of (1) on aluminum paste or aluminum powder and (2) a thermoplastic resin, where said pellets contain about 0.5% by weight or less of white spirit.

4,356,225
PAPERMARKERS INTERWOVEN WET PRESS FELT

Marcel Dufour, Sryrieix, France, assignor to Ascoe Felts, Inc., Clinton, S.C.

Filed May 18, 1981, Ser. No. 264,334
Int. Cl.³ B32B *5/06*
U.S. Cl. 428—234 **13 Claims**



1. A multi-layer papermaker's wet felt comprising:

(a) at least three layers of machine direction yarns, said layers having their respective machine direction yarns aligned vertically; and

(b) a plurality of cross machine direction yarns for interweaving said three machine direction layers, each of said cross machine direction yarns weaving in a repeat pattern having interlacings with machine direction yarns in at least two of said machine direction layers, said repeat pattern having floats which extend for at least two machine direction yarns thereby maintaining said machine direction layers in vertical alignment.

4,356,226
LAMINATED STRUCTURE FOR FURNISHING, COMPRISING AT LEAST ONE DECORATIVE LAYER COMBINED WITH A SUPPORT

Pierre Georlette, Hamme-Mille, and Rene Bouteille, Braine-l'Alleud, both of Belgium, assignors to Solvay & Cie, Brussels, Belgium

Filed May 8, 1979, Ser. No. 37,049
Claims priority, application France, May 8, 1978, 78 13803; Jul. 17, 1978, 78 21349
Int. Cl.³ B32B *23/08, 27/06, 27/10*
U.S. Cl. 428—246 **22 Claims**

1. A laminated structure comprising at least one decorative layer, of organic nature, which layer is selected from the group consisting of plastic films and sheets, textiles, papers and sheets of veneer, and which layer is combined, by hot pressing, with a support comprising a polyolefine sheet, wherein the polyolefine sheet comprises from 10 to 90% by weight of cellulose fibres and from 90 to 10% by weight of a polyolefine which is modified by polar monomeric units derived from at least one monomer selected from the group consisting of unsaturated carboxylic acids, the corresponding anhydrides and derivatives thereof.

17. A laminated structure according to claim 1, wherein the decorative layer consists of a textile containing polyolefine fibres, which textile is covered on its visible face with a layer of a plastic selected from the group consisting of vinyl resins and polyurethane resins.

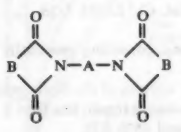
4,356,227
FIBER MATERIALS PREIMPREGNATED WITH DUROMERIC POLYIMIDE RESINS AND PROCESS FOR THEIR PREPARATION

Horst Stenzenberger, Schriesheim, Fed. Rep. of Germany, assignor to Technochemie GmbH, Dossenheim, Fed. Rep. of Germany

Filed Oct. 31, 1980, Ser. No. 202,655
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1979, 2943964
The portion of the term of this patent subsequent to Jul. 8, 1997, has been disclaimed.
Int. Cl.³ C08G *73/12;* **B05D** *3/02;* **B32B** *7/00, 27/34*
U.S. Cl. 428—265 **7 Claims**

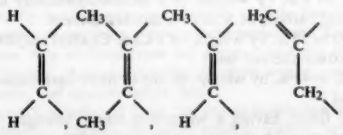
1. A preimpregnated fibrous structural material from a duromeric polyimide resin comprising

(a) a heat curable imide resin produced by reaction between an N,N'-bisimide of an unsaturated dicarboxylic acid of the general formula I

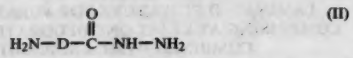


(I)

wherein A is a divalent organic group having at least two carbon atoms and B is a divalent organic group selected from the group consisting of



and a hydrazide of an amino acid of the general formula II



(II)

wherein D is a divalent organic group in a molar ratio of moles of N,N'-bisimide (I) to moles of aminobenzoic acid hydrazide (II) of between 1:1 and 10 and,

(b) fibrous materials selected from the group consisting of carbon fibers, glass fibers and aromatic polyamide fibers in the form of unidirectional mat or fabric, said fibrous materials impregnated with said imide resin.

4,356,228

FIBER-REINFORCED MOLDABLE SHEET AND PROCESS FOR PREPARATION THEREOF

Hirokazu Kobayashi, and Minoru Kitanaka, both of Nagoya, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed May 18, 1981, Ser. No. 264,619
Claims priority, application Japan, May 23, 1980, 55/67739
Int. Cl.[3] B32B 5/16
U.S. Cl. 428—283 14 Claims

1. A fiber-reinforced moldable sheet comprising a thermoplastic resin and at least two reinforcing agents differing in the length/diameter ratio, which are incorporated with said thermoplastic resin in a mixed state, wherein one reinforcing agent (A) contained in said composite sheet is a carbon fiber having a length/diameter ratio of 200 to 30,000 and the other reinforcing agent (B) is a fibrous reinforcing agent having a length-/diameter ratio of less than 50, and the contents of the reinforcing agents (A) and (B) in said moldable sheet are 5 to 30% by volume and at least 5% by volume, respectively, the sum of the contents of the reinforcing agent (A) and (B) being in the range of from 20 to 50% by volume.

4,356,229

BONDED NONWOVEN FABRICS SUITABLE FOR DIAPER COVERSTOCK

John G. Brodnyan, Langhorne; Walter G. De Witt, III, Southampton; Robert A. Gill, Abington, and Gary D. Stelling, Ambler, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 966,422, Dec. 4, 1978, abandoned. This application Oct. 20, 1980, Ser. No. 198,426
Int. Cl.[3] D04H 1/58
U.S. Cl. 428—288 24 Claims

1. A nonwoven fabric consisting essentially of fibers and a binder,

(A) at least 50%, by weight, of the fibers being hydrophobic fibers having a moisture regain less than 2.5% of the fiber weight at 70° F. and 65% RH,

(B) the binder being free of formaldehyde condensates and comprising a water-insoluble, hydrophobic, emulsion copolymer of ethylenically unsaturated monomers comprising

(a) 1 to 8%, by weight, of a monoethylenically unsaturated carboxylic acid or a mixture thereof.

(b) 50 to 75%, by weight, of a C_4 to C_8 alkyl acrylate or a mixture thereof, and

(c) 20 to 49%, by weight, of one or more hard monomers, and

(C) the fabric having a water-wet tensile strength, determined on a 2.5 cm wide specimen having a dry weight between 23 and 26 g/m^2, of at least 1.5 kg.

4,356,230

MOLDED PLASTIC PRODUCT HAVING A PLASTIC SUBSTRATE CONTAINING A FILLER AND AN IN-MOLD PLASTIC COATING FIRMLY BONDED THEREON AND A PROCESS FOR ITS MANUFACTURE

Peter R. Emanuel, Troy; Syed Salman, Sterling Heights, and Gulam Mohiuddin, Brighton, all of Mich., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jul. 10, 1980, Ser. No. 167,250
Int. Cl.[3] B29D 3/02; B32B 9/04
U.S. Cl. 428—290 16 Claims

1. A molded part containing a plastic substrate and a firmly adherent coating thereon, the plastic substrate containing a continuous fibrous reinforcement material therein present at least in part in proximity to the surface of the substrate, said coating having been transferred from the mold surface to the substrate during the molding operation, said molded part having a smooth surface as molded and without any subsequent finishing thereof.

9. A process of producing a molded part containing a plastic substrate and a firmly adherent coating thereon, the plastic substrate containing a continuous fibrous reinforcement material therein present at least in part in proximity to the surface of the substrate, said process comprising

coating the surface of a mold, prior to molding said part, with a coating composition containing a reaction promoter for a reactive plastic molding material but not for said coating,

introducing the reactive plastic molding material and the filler into the mold, said molding material and filler together comprising said plastic substrate,

said reaction promoter in said coating being selected from the group consisting of a catalyst, a crosslinking promoter and a crosslinking initiator for said reactive plastic molding material and being present in an amount sufficient to transfer said coating composition from said mold surface to said substrate and bond it thereto,

molding said part and

removing said part from the mold, said molded part upon removal from the mold having a smooth surface thereon as molded and without any subsequent surface treatment thereof.

4,356,231

POROUS OXIDE DIAPHRAGM FOR ALKALINE ELECTROLYSES, AND MANUFACTURE THEREOF

Jiri Divisek; Heinrich Schmitz, both of Jülich, and Renke Hesse, Aachen, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschrankter Haftung, Jülich, Fed. Rep. of Germany

Filed Jul. 24, 1981, Ser. No. 286,690
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1980, 3031064
Int. Cl.[3] B32B 15/02
U.S. Cl. 428—304.4 12 Claims

1. Porous oxide diaphragm for alkaline electrolysis, particularly water electrolysis; including a permeable framework-forming support; and a matrix of an oxidized thereon layer formed by oxidized on metal powder particles united and fixed by mutually penetrating oxide layers formed through oxidation in situ.

9. Diaphragm as claimed in claim 1, said oxidized on layer having a thickness of about 10 to 500 μm.

4,356,232
METHOD FOR PRODUCING MAGNETIC RECORDING MEDIUM

Eiichi Tadokoro; Haruo Masuda; Nobutaka Yamaguchi, and Masaaki Fujiyama, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 10, 1981, Ser. No. 252,746
Claims priority, application Japan, Apr. 10, 1980, 55-47178
Int. Cl.³ G11B 5/70
U.S. Cl. 428—325 6 Claims

4. A magnetic recording medium comprising a non-magnetic support having coated thereon a magnetic recording layer comprising a ferromagnetic powder, a binder and non-alkali glass beads containing alkali elements at a level not more than 0.1% by weight wherein said beads are present in an amount less than about 0.1 weight % based on the amount said ferromagnetic powder.

4,356,233
PRIMED INORGANIC SUBSTRATES OVERCOATED WITH CURABLE PROTECTIVE COMPOSITIONS

Roger W. Lange, Maplewood, and Alek P. Szecsy, Inver Grove Heights, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 20, 1981, Ser. No. 265,467
Int. Cl.³ B32B 27/38; C08L 83/00
U.S. Cl. 428—336 20 Claims

1. A layered structure comprising

a. an inorganic substrate selected from metals, metal oxides, and ceramics,

b. a primer composition having a thickness in the range of 0.02 to 0.5 microns, coated upon said substrate, said priming composition comprising:

(1) one part by weight of a non-amino- or non-amido-containing silane of the formula:

$$[R^1]_m—Si—[R^2]_n \quad (1)$$

in which R^1 is an alkyl or cycloalkyl group that can be unsubstituted or substituted by an ethenyl, methethenyl, acryloxy, methacryloxy, epoxy, mercapto, or an isocyanato group, said substituted group having a total of two to ten carbon atoms and said unsubstituted group having a total of one to eight carbon atoms; R^2 is a hydrolyzable group selected from alkoxy groups having one to eight carbon atoms, and acyloxy groups having two to eight carbon atoms; m is an integer from 1 to 3; n is an integer from 1 to 3, with the proviso that $m+n=4$;

(2) 1 to 50 parts by weight of metal ester of the formula:

$$M[OR^3]_x \quad (2)$$

in which M is a metal selected from the group comprising titanium, tantalum, zirconium, aluminum, and antimony; R^3 is an alkyl group having from one to eight carbon atoms; and x is equal to the number of valence bonds of M, and

(3) 0:1 to 10:1 moles by weight of an inorganic acidic material, or 0:1 to 20:1 moles by weight of an organic acidic material, compared to the total moles by weight of metal ester plus silane,

(4) 50 to 99 weight percent of solvent consisting essentially of organic solvent compared to the total composition weight, and

c. at least one layer of an overcoating composition polymerized in situ and comprising at least one organic monomer selected from epoxy and vinyl monomers.

4,356,234
THERMOPLASTIC SYNTHETIC FILAMENTS AND PROCESS FOR PRODUCING THE SAME

Shiro Kumakawa, Ibaraki, and Toshimasa Kuroda, Takatsuki, both of Japan, assignors to Teijin Limited, Osaka, Japan

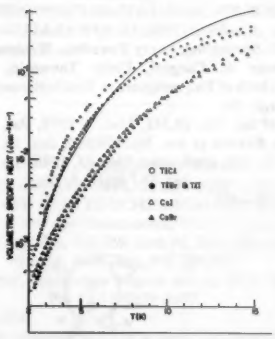
Filed Mar. 5, 1981, Ser. No. 240,834
Claims priority, application Japan, Mar. 12, 1980, 55-30259; Mar. 19, 1980, 55-33947; Mar. 19, 1980, 55-33948
Int. Cl.³ D02G 3/00
U.S. Cl. 428—372 13 Claims

1. Thermoplastic synthetic filaments comprising 85 to 99% by weight of a thermoplastic matrix polymer and 1 to 15% by weight of a dispersed polymer comprising at least one polysulfone which is incompatible with said matrix polymer and dispersed in the form of fine particles in said matrix polymer, which filaments are characterized by numerous fine protuberances consisting of said dispersed polymer and formed in the number of at least 5 per 10 square microns on the peripheral surface of each individual filament.

4,356,235
THALLOUS AND CESIUM HALIDE MATERIALS FOR USE IN CRYOGENIC APPLICATIONS

William N. Lawless, c/o Lake Shore Ceramics, Inc., 64 E. Walnut St., Westerville, Ohio 43081

Continuation-in-part of Ser. No. 41,039, May 21, 1979, Pat. No. 4,296,147. This application Aug. 3, 1981, Ser. No. 289,555
The portion of the term of this patent subsequent to Oct. 20, 1998, has been disclaimed.
Int. Cl.³ B32B 15/00
U.S. Cl. 428—379 5 Claims



1. In combination, a superconducting metal wire having an electrically insulating coating thereon, said electrically insulating coating comprising a mixture of components X and Y,

where X is selected from the group consisting of thallous chloride, thallous bromide, thallous iodide, cesium bromide, and cesium iodide, and

where Y is selected from the group consisting of thallous chloride; thallous bromide; thallous iodide; cesium bromide; cesium iodide; and epoxy resin; AB_2O_4, where A is a Group IIB metal ion with or without other divalent

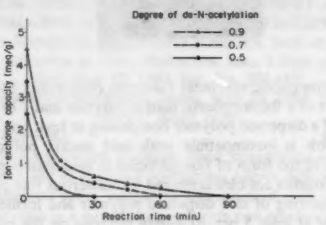
metal ions and B is chromium ion with or without other trivalent metal ions; AB_2O_6, where A is manganese or nickel ion or both, with or without other divalent metal ions and B is niobium, tantalum, or both; and A_2BCO_6, where A is lead ion with or without other divalent metal ions, B is gadolinium or manganese with or without other trivalent metal ions, and C is niobium, tantalum or both.

4,356,236

SPHERICALLY SHAPED MATERIAL COMPRISING ACYLATED PRODUCT OF DE-N-ACETYLATED CHITIN

Junichi Koshugi, Tokyo, Japan, assignor to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 4, 1980, Ser. No. 156,476
Claims priority, application Japan, Jun. 15, 1979, 54-75401
Int. Cl.³ B32B *1/00*; C08B *37/08*
U.S. Cl. 428—403 19 Claims



1. A spherically shaped material at least the surface layer of which comprising an acylated product of de-N-acetylated chitin or a salt thereof.

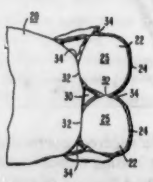
8. A process for producing a spherically shaped material of an acylated product of de-N-acetylated chitin, comprising dispersing an aqueous solution of a de-N-acetylated chitin or a salt thereof dropwise as minute droplets into an anhydride of an organic acid having the same acyl group as in said acylated product and containing a suspending agent, thereby acylating said minute droplets of said aqueous solution of the de-N-acetylated chitin to obtain a spherically shaped material.

4,356,237

POROUS ENCAPSULATING COMPOSITION FOR ELECTRICAL APPARATUS

Gerhard R. Sprengling, Derry Township, Westmoreland County, and Louis A. Cargnel, Unity Township, Westmoreland County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 24,341, Mar. 7, 1979, Pat. No. 4,243,623, which is a division of Ser. No. 870,896, Jan. 19, 1978, Pat. No. 4,164,619. This application May 13, 1980, Ser. No. 149,357
Int. Cl.³ B32B *5/16*
U.S. Cl. 428—404 7 Claims



1. A composition comprising:

a particulate filler material, the adjacent particles of which are in direct particle-to-particle contact;

said particulate filler material including shell molding sand having shell molding resin on each particle, and gravel, with the average particle size of said gravel being substantially larger than the average particle size of said shell molding sand,

said shell molding sand being evenly dispersed throughout the larger particles of said gravel,

said shell molding resin being distributed such that the adjacent particles of said shell molding sand, and the adjacent particles of said shell molding sand and gravel, are in direct particle-to-particle contact devoid of intervening shell molding resin, with said shell molding resin further being distributed to coat the remaining portions of the shell molding sand, and to function as a binder material which is in a hardened solid state, including beads of said shell molding resin distributed to surround the direct particle-to-particle contact points between contiguous particles of said filler material, to cohesively join together said contiguous particles and provide a structure having a compressive strength of about 13000 psi, and a thermal conductivity of about 0.051 W/in.° C.,

said shell molding resin being selected such that it has the characteristics of being dryable on the shell molding sand, subsequently liquifiable to a viscosity which permits sufficient flow thereof to achieve said direct particle-to-particle contact points between contiguous particles of said filler material, and subsequently solidifiable to provide said beads of resin around said contact points.

4,356,238

COATED ARTICLES BEARING A COATING OF A BLEND OF AN IONOMER RESIN AND AN ALKENYL SUCCINIC ANHYDRIDE

Pallavoor R. Lakshmanan, Houston, Tex., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

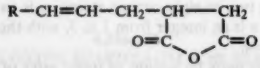
Division of Ser. No. 209,812, Nov. 24, 1980, Pat. No. 4,324,872. This application Oct. 22, 1981, Ser. No. 313,556
Int. Cl.³ B32B *11/00*
U.S. Cl. 428—461 2 Claims

1. A sheet of paper, aluminum foil, ethylene polymer or isotactic propylene polymer bearing a coating of a composition consisting essentially of an intimate fusion blend of;

(a) 100 parts by weight of an ionomer resin, and

(b) about 5 to 900 parts by weight of an alkenyl succinic anhydride;

said ionomer resin being a metal salt of an ethylene-acid copolymer which is a copolymer of ethylene and acrylic or methacrylic acid having an acid content of about 1–10 mol % and having a high load melt index of at least about 1.0 and a normal load melt index of up to about 50; and said alkenyl succinic anhydride having the structure;



where R is an alkyl group containing about 13 to 49 carbon atoms.

4,356,239

OPEN AND SHORT CIRCUIT TEST APPARATUS

Jimmy L. Stewart, Clinton, Ind., assignor to General Battery Corporation, Reading, Pa.

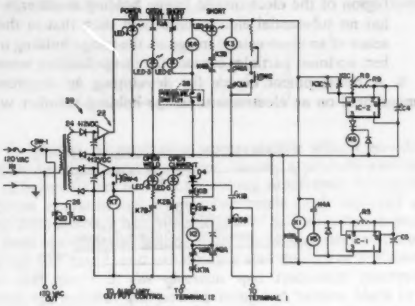
Division of Ser. No. 108,470, Dec. 31, 1979, Pat. No. 4,282,292. This application Jan. 19, 1981, Ser. No. 226,060
Int. Cl.³ H01M *14/00*
U.S. Cl. 429—7 7 Claims

1. For a multicelled storage battery, wherein each cell is comprised of a plurality of interleaved positive and negative plates, said plates having upstanding lugs arranged so that each positive lug is along one side of said cell and each negative lug is along an opposite side of said cell, wherein all of said positive lugs are connected by a first conductive strap having a connec-

tor lug associated therewith and all of said negative lugs are connected by a second conductive strap having a connector lug associated therewith, said cells being alternately arranged within said battery so that the first conductive strap lug of one cell is adjacent to the second conductive strap lug of an adjoining cell, said cells being connected in series by welding together the first strap lug in one cell to the second strap lug in the adjoining cell, and further said battery comprising an external terminal at each end of said series, an apparatus for testing said batteries for short circuits between plates of opposite polarity within a cell and for electrical continuity between the cells of said battery comprising:

a. power means,

b. terminal means adapted for placement on said battery and including circuit means forming a series electrical connection with the power means, the positive and negative strap lugs along one side of the battery, and the positive and negative strap lugs along the other side of said battery;



c. control means associated with the circuit means of said terminal means so that the lugs along one side of the battery are electrically separated from the lugs along the other side of said battery, and further adapted to allow the passage of current through said series electrical connection substantially in only one direction; and

d. switch means associated with said power means and adapted to first apply a positive voltage across the circuit means so that the flow of current is opposed by said control means, thus preventing current from flowing through said series electrical connection, unless there is a short circuit between one or more parallel plates of opposing polarity within a cell, and secondly to reverse polarity of the applied voltage so that a current will be permitted to flow through said control means and said series electrical connection if there is continuity in the intercell welds of said battery.

4,356,240

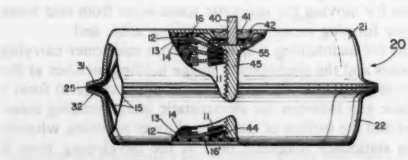
EXTREMELY HIGH RATE FLAT CELL

Arabinda N. Dey, Needham, and Noble E. Hamilton, Middleton, both of Mass., assignors to Duracell Inc., Bethel, Conn.

Filed Oct. 27, 1980, Ser. No. 200,819

Int. Cl.³ H01M *4/36*

U.S. Cl. 429—101 **7 Claims**



1. An electrochemical cell comprising multiple layers of anode and cathode electrode materials contained in a cell container wherein all of the layers of one of said anode and cathode electrode materials embody conductive projections therefrom which are positioned between elements of said cell container which are hermetically sealed to seal said cell, with said conductive projections being electrically interconnected with said elements and which conductive projections form part of the seal of said cell.

4,356,241

SODIUM SULPHUR CELLS

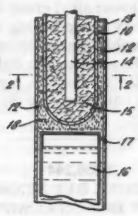
Michael L. Wright, Allestree, and Michael D. Hames, Spondon, both of England, assignors to Chloride Silent Power Limited, London, England

Filed Jul. 7, 1981, Ser. No. 280,957

Claims priority, application United Kingdom, Jul. 21, 1980, 8023739

Int. Cl.³ H01M *4/36*

U.S. Cl. 429—104 **11 Claims**



1. A sodium sulphur cell having a beta-alumina solid electrolyte element separating an anodic region containing sodium from a cathodic region containing sulphur/sodium polysulphides, said beta-alumina solid electrolyte element has had at least part of its surface, to be exposed to the sodium, pretreated with a first metal which will form an alloy of sodium, wherein there is provided, in the anodic region adjacent the electrolyte element, a second metal which will react with sodium oxide (Na_2O) to form a sodium oxide compound with the second metal or an oxide thereof.

4,356,242

ELECTRODE CONSTRUCTION FOR LIQUID ELECTROLYTE ELECTROCHEMICAL GENERATORS

Denis Doniat, 14 rue des Marronniers, 75016 Paris, France

Continuation of Ser. No. 164,839, Jun. 30, 1980. This application Jan. 11, 1982, Ser. No. 338,322

Claims priority, application France, Jul. 6, 1979, 79 17540

Int. Cl.³ H01M *4/72*

U.S. Cl. 429—234 **24 Claims**

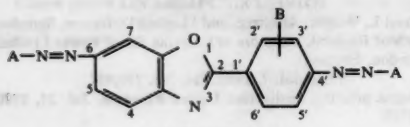
1. Electrode construction for a liquid electrolyte electrochemical generator, said electrode being formed from a substrate constituted of a non-conducting microporous film, having a porosity at least equal to 50% and a thickness at most equal to about 500 microns, whose pores have a diameter between 3 and 30 microns, all the surfaces of the pores being metallized by at least a first layer, thus forming a charge collector, a thin deposit of active electrode material being deposited on said at least first layer, the total thickness of said at least first layer and of said deposit being such as to avoid clogging of the pores.

4,356,243
ELECTROPHOTOGRAPHIC MEDIA WITH BENZOXAZOLE GROUP CONTAINING DIS-AZO COMPOUND

Shozo Ishikawa; Kazuharu Katagiri; Katsunori Watanabe; Shigeto Ohta, and Makoto Kitahara, all of Tokyo, Japan, assignors to Copyer Co., Ltd., Tokyo, Japan

Filed Feb. 19, 1981, Ser. No. 235,793
Claims priority, application Japan, Feb. 19, 1980, 55-18574
Int. Cl.³ G03G 5/06
U.S. Cl. 430—58 **16 Claims**

1. An electrophotographic light-sensitive medium comprising a light-sensitive layer containing a dis-azo compound represented by the Formula (1)



(1)

wherein A is an aromatic coupler containing therein a phenolic hydroxy group, and B is selected from the group consisting of hydrogen, a halogen, a lower alkyl group having 1 to 4 carbon atoms, and a lower alkoxy group having 1 to 4 carbon atoms.

9. An electrophotographic light-sensitive medium as in claim **1**, **2**, **3**, **4**, **5**, **6**, **7**, or **8**, wherein the light-sensitive medium comprises an electrically conductive layer, a light-sensitive charge generation layer containing the dis-azo compound, and a charge transport layer.

4,356,244
QUINOXALINE CYANINE DYE SENSITIZED ORGANIC ELECTRON DONOR COMPOUNDS

Louis M. Leichter, Woodbury; Terry J. Sonnonstine, White Bear Lake; John J. Stofko, Jr., St. Paul, all of Minn., and Paolo Beretta, Ferrania, Italy, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 23, 1981, Ser. No. 236,653
Int. Cl.³ G03G 5/06
U.S. Cl. 430—82 **16 Claims**

1. A photosensitive layer comprising an organic electronically active electron donor compound sensitized with a sensitizing amount of an imidazo-[4,5-b]quinoxaline cyanine dye having at least one phenylsulfonyl or benzoyl substituent on an imidazo-[4,5-b]quinoxaline nucleus.

2. The layer of claim **1** wherein said phenylsulfonyl or benzoyl substituent is on the 6- or 7-position of the imidazo-[4,5-b]quinoxaline nucleus.

4,356,245
METHOD AND APPARATUS FOR ELECTROPHOTOGRAPHIC, IMAGE DEVELOPMENT WITH MAGNETIC TONER

Nagao Hosono, Shizuoka; Koichi Kinoshita, Narashino, and Toru Takahashi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 938,101, Aug. 30, 1978, abandoned. This application Apr. 21, 1980, Ser. No. 141,919
Claims priority, application Japan, Sep. 10, 1977, 52-109237; Sep. 10, 1977, 52-109238; Sep. 10, 1977, 52-109239
Int. Cl.³ G03G 13/09
U.S. Cl. 430—122 **20 Claims**

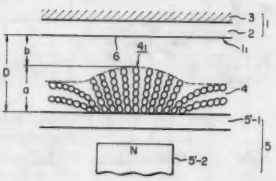
1. A development method for developing an electrostatic image held on an electrostatic image holding member which can be used repeatedly for electrostatic latent image formation, said method comprising the steps of:

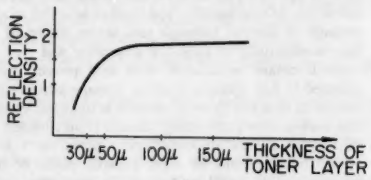
forming a layer of magnetic toner particles on a surface of a toner carrying member, said toner carrying member being made of a non-magnetic material and having a stationary magnetic pole at a developing zone on the opposite side of said toner particle layer forming surface thereof to establish a stationary magnetic field directed toward the surface of the electrostatic image holding member;

bringing said toner carrying member provided with the magnetic toner particle layer on the surface thereof adjacent to the electrostatic image holding member provided with an electrostatic image on its surface; and

maintaining said toner carrying member and the electrostatic image holding member in a spacing range at the developing zone to form a space gap between the electrostatic image holding member and the surface of the layer of toner particles where the stationary magnetic field at the developing zone is effective to orient the magnetic toner particles in the direction of the magnetic field to assist in the deposition of toner particles on the image region of the electrostatic image holding member due to the attraction of the electrostatic field generating therefrom, the stationary magnetic field alone being insufficient to transfer the magnetic toner particles to the non-image background region of the electrostatic image holding member which has no substantial electrostatic field such that in the absence of an electrostatic image on the image holding member, no toner particles contact the image holding member.

8. A development device for developing an electrostatic image held on an electrostatic image holding member which





can be used repeatedly for electrostatic latent image formation, said device comprising in combination:

toner carrying means having a surface to hold a toner particle layer thereon, said toner carrying means being made of a non-magnetic material;

magnet means for generating a stationary magnetic field at a developing zone through said non-magnetic toner carrying means toward the surface of the electrostatic image holding member;

means for forming a layer of magnetic toner particles of substantially uniform thickness on said surface of said toner carrying means;

means for moving the magnetic toner layer from said toner layer forming means to a developing zone; and

means for maintaining a space between said toner carrying means and the electrostatic image holding member at the developing zone within a predetermined range to form a space gap between the electrostatic image holding member and the surface of the layer of toner particles, wherein the stationary magnetic field at the developing zone is directed toward the electrostatic image holding member to thereby assist in depositing toner particles on the image region of the electrostatic image holding member due to

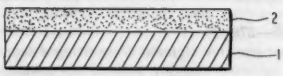
the attraction of the electrostatic field generating therefrom, the stationary magnetic field being insufficient to transfer the magnetic toner particles to the non-image background region of the electrostatic image holding member such that in the absence of an electrostatic image no toner particles contact with the image holding member, whereby background development is prevented.

4,356,246

METHOD OF MAKING α-SILICON POWDER, AND ELECTROPHOTOGRAPHIC MATERIALS INCORPORATING SAID POWDER

Masatoshi Tabei; Keiji Takeda; Kazuhiro Kawaziri, and Akio Higashi, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 16, 1980, Ser. No. 159,566
Claims priority, application Japan, Jun. 15, 1979, 54-74553
Int. Cl.³ G03G *5/082*
U.S. Cl. 430—136 **4 Claims**



1. A process of producing noncrystalline silicon powder comprising silicon and hydrogen, having a primary particle size of from 0.01 μm to 1 μm, exhibiting an infrared absorption spectrum characterized by an absorbance peak centered at about 2000 cm^{-1}, wherein the height of said absorbance peak is at least one-tenth the height of the absorbance peak centered at about 630 cm^{-1}, and exhibiting a spin density of not more than 10^{18} cm^{-3} in the electron spin resonance spectrum thereof, the color of said powder being red, brown, black or a combination thereof, said process comprising submitting silane or a derivative thereof to glow discharge decomposition and to further heating before, during or after such decomposition at a temperature up to about 650° C. to directly form said powder without grinding.

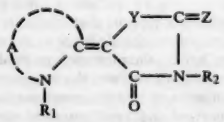
4,356,247

LIGHT-SENSITIVE COMPOSITIONS

Yoshimasa Aotani; Teruo Kojima, both of Minami-ashigara, and Eiji Nakakita, Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 27, 1980, Ser. No. 200,653
Claims priority, application Japan, Oct. 29, 1979, 54-139474
Int. Cl.³ G03C *1/71*
U.S. Cl. 430—195 **9 Claims**

1. A light-sensitive composition consisting essentially of a mixture of a sensitizer and a photo-crosslinkable polymer selected from polymers having a polymerization unit having bonded thereto an R—CH=CH—CO— group, wherein R is an aryl group or a heterocyclic group, or polyesters having a —CH=CH—CO— group in their main polymer chain, or a mixture of a sensitizer, a compound including a light-sensitive azido group and a polymer reactive with a decomposition product of azido groups to be formed upon exposure to light, said sensitizer comprising the compound represented by the formula (I)



(I)

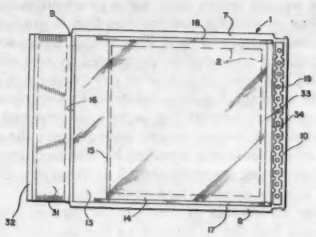
wherein A represents a non-metallic group necessary for forming a heterocyclic ring containing nitrogen; R_1 represents an alkyl group or a substituted alkyl group; R_2 represents hydrogen, an alkyl group, a substituted alkyl group, an aryl group or a substituted aryl group; and Y and Z each represents an oxygen atom or a sulfur atom.

4,356,248

PHOTOGRAPHIC PRODUCT

Thomas P. McCole, South Natick, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed May 26, 1981, Ser. No. 267,013
Int. Cl.³ G03C *1/48*
U.S. Cl. 430—209 **7 Claims**



1. A photographic film unit, comprising first and second generally rectangular superposed sheets of equal widths and unequal lengths, at least one of said sheets comprising photosensitive constituents, a rupturable pod of fluid processing composition disposed on a leading edge of the longer of said sheets confronting a leading edge of the shorter sheet, said longer sheet terminating in a trailing edge protruding beyond a corresponding trailing edge of the shorter sheet, a panel of flexible liquid impermeable material having a first edge adhered to the trailing edge of said longer sheet and extending over to an opposite second edge adherent to said shorter sheet in spaced regions leaving a plurality of nonadhering regions forming gas vents, a perforated spacer element located in a trap region between the trailing edges of said sheets and confined by said flexible panel, said spacer element being secured to said panel only along one edge confronting said second edge of said panel and being free of other attachment to said panel and said sheets, whereby a major portion of said panel between said first and second edges of said panel is free to flex in compliance with pressures exerted by gases and fluid processing composition emerging from between the trailing edges of said sheets to accommodate the free flow of said gases and processing composition around said spacer element and through the perforations thereof in parallel paths to said nonadhering regions of said second edge of said panel.

4,356,249

TIMING LAYERS AND AUXILIARY NEUTRALIZING LAYER FOR COLOR TRANSFER ASSEMBLAGES CONTAINING POSITIVE-WORKING REDOX DYE-RELEASERS

Edward P. Abel, Webster, and Edward Weissberger, Pittsford, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 30, 1981, Ser. No. 316,630
Int. Cl.³ G03C *1/40, 1/10, 7/00, 5/24*
U.S. Cl. 430—215 **38 Claims**

1. In a photographic assemblage comprising:
(a) a photographic element comprising a support having thereon at least one negative-working, photosensitive silver halide emulsion layer having associated therewith a positive-working, redox dye releaser;
(b) a dye image-receiving layer;
(c) a neutralizing layer for neutralizing an alkaline processing composition;

(d) a first timing layer located between said neutralizing layer and said silver halide emulsion layer; and

(e) a second timing layer located between said first timing layer and said neutralizing layer;

said first and second timing layers being so located that said processing composition must first permeate said timing layers before contacting said neutralizing layer, said neutralizing layer being located on the side of said second timing layer which is farthest from said dye image-receiving layer, the improvement wherein:

(i) said first timing layer has a negative temperature coefficient;

(ii) said second timing layer has a penetration time by said alkaline processing composition that is greater than the penetration time of said first timing layer, so that said neutralizing layer will be permeated by said alkaline processing composition only after development of said silver halide emulsion has been substantially completed; and

(iii) an auxiliary neutralizing layer is present and is located between said first and second timing layers, the concentration of available acid supplied by said auxiliary neutralizing layer being approximately 3 to 20 percent of the available acid supplied by said neutralizing layer.

4. In the assemblage of claim 1, the further improvement wherein said first timing layer is an N-substituted acrylamide polymer or copolymer.

4,356,250

USE OF ZINC SALTS TO INCREASE DYE STABILITY

Nayyir F. Irani, and Thomas O. Maier, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 12, 1981, Ser. No. 224,415

Int. Cl.³ G03C *5/54*

U.S. Cl. 430—216 **32 Claims**

1. In a photosensitive element comprising a support having thereon at least one silver halide emulsion layer having associated therewith a redox dye-releasing material, the improvement wherein said element contains a soluble zinc salt in such a location and concentration that (a) it will be diffusible in said element during processing, and (b) the dye which is released from said redox dye-releasing material during said processing will have an increased stability to light exposure, said zinc salt being present in a concentration of at least about 10 mg/m² of element.

4,356,251

MULTILAYER PHOTOSENSITIVE ELEMENT WITH SOLVENT-SOLUBLE LAYER

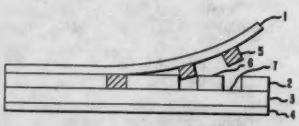
Abraham B. Cohen, Springfield, and Roxy Fan, East Brunswick, both of N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 747,024, Dec. 2, 1976, abandoned, which is a continuation-in-part of Ser. No. 583,455, Jun. 3, 1975, abandoned. This application Aug. 4, 1980, Ser. No. 174,919

The portion of the term of this patent subsequent to Jul. 25, 1997, has been disclaimed.

Int. Cl.³ G03C *1/78*

U.S. Cl. 430—253 **18 Claims**



1. A peel apart photosensitive element comprising in order from top to bottom, (1) a strippable cover sheet, (2) a sole dry photoadherent layer comprising a material with ethylenically unsaturated or benzophenone type groups, (3) a solvent-soluble, nontonable, polymeric, nonphotosensitive contiguous layer, and (4) a sheet support, the exposed areas of said photoadherent layer, after imagewise exposure of said element through the cover sheet (1) to actinic radiation, having greater adhesion to said contiguous layer than to said cover sheet and are not removable with said cover sheet and the unexposed areas of said photoadherent layer having greater adhesion to said cover sheet than to said contiguous layer and are removable with said cover sheet whereby after stripping the cover sheet (1) leaving an unhardened positive image on the cover sheet and an image of uncovered contiguous layer on the element, said exposed areas of the photoadherent layer being insoluble under a condition under which said contiguous layer is solvent-soluble.

4,356,252

PHOTOSENSITIVE NEGATIVE-WORKING TONABLE ELEMENT

Ross A. Lee, Webster, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 106,401, Dec. 26, 1979, Pat. No. 4,294,909. This application May 4, 1981, Ser. No. 259,956

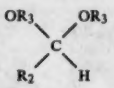
Int. Cl.³ G03C *5/04*

U.S. Cl. 430—270 **6 Claims**

1. A photosensitive element comprising a support bearing a layer of a negative-working tonable photoimaging composition which consists essentially of

(a) at least one organic polymeric binder taken from the group consisting of polyvinylformal, polyvinylpyrrolidone, polyacrylate, cellulose acetate, polymethacrylate, and polyvinyl acetate;

(b) a photosensitizer which upon absorption of actinic radiation is capable of generating an acid; and (c) at least one acetal compound of the formula



wherein R_2 is alkyl of 1 to 18 carbon atoms, furyl, substituted furyl, phenyl, substituted phenyl, naphthyl, and substituted naphthyl, R_3 is alkyl of 1 to 18 carbon atoms, and OR_3 when taken together form a 5, 6 or 7 membered ring,

(d) a plasticizer in an amount of up to 20% by weight based on the total dry weight of the photoimaging composition; and

(e) a polymeric anhydride in an amount up to 10% by weight based on the total weight of solids

the polymeric binder (a) being plasticized by the decomposition product of the acetal compound.

4,356,253

PHOTOIMAGING PROCESS FOR FORMING MULTICOLOR IMAGES

John G. Buzzell, Towanda, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 12, 1980, Ser. No. 215,699

Int. Cl.³ G03C *1/90*

U.S. Cl. 430—291 **9 Claims**

1. In a process for forming a multicolor image by photopolymerizing comprising:

1. laminating to a receptor surface a photopolymerizable element comprising a support that transmits actinic radiation and a photopolymerizable layer so as to form a laminated structure having the photopolymerizable layer contiguous to the receptor surface, the receptor surface having greater adhesion to the photopolymerizable layer in both its polymerized and unpolymerized states than does the support;

2. exposing the layer imagewise through the support to actinic radiation to selectively raise the stick temperature of those areas receiving the radiation;

3. removing the support without transfer thereto of either

exposed or underexposed areas of the photopolymerizable layer;

4. applying colorant material to the surface of the layer;
5. distributing the colorant material over the image surface whereby the distributed colorant material becomes embedded solely in the underexposed areas;
6. physically removing colorant material from the exposed image areas which are left substantially free of the colorant material; and
7. repeating said steps of laminating, exposing, removing, applying, distributing and removing one or more times, each succeeding photopolymerizable element having its photopolymerizable layer contiguous to the exposed and colored surface of the last previously laminated photopolymerizable layer; the improvement wherein the photopolymerizable element comprises a polyethylene terephthalate support which is surface treated by electrical discharge at the rate of 1.0 to 6.0 joules/inch^2, the treated surface bearing the photopolymerizable layer which comprises a free radical initiated, chain propagating, addition polymerizable compound taken from the group consisting of trimethylolpropanetrimethacrylate, polyoxyethylatedtrimethylolpropanetriacrylate, and a mixture of polyoxyethylatedtrimethylolpropanetriacrylate and one of the addition polymerizable compounds taken from the group consisting of trimethylolpropanetrimethacrylate, trimethylolpropanetriacrylate, pentaerythritoltriacrylate, tetraethyleneglycoldiacrylate and tetraethyleneglycoldimethacrylate, at least one compatible organic polymeric acrylate ester binder and optionally a polyvinyl acetate binder which may be present in a weight ratio of less than 4 to 3 with respect to the acrylate ester binder component, and an addition polymerization initiator or initiator system activatable by actinic radiation.

4,356,254

IMAGE-FORMING METHOD USING O-QUINONE DIAZIDE AND BASIC CARBONIUM DYE

Yohnosuke Takahashi; Hiromichi Tachikawa; Fumiaki Shinozaki, and Tomoaki Ikeda, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 7, 1980, Ser. No. 166,517

Claims priority, application Japan, Jul. 5, 1979, 54-85395

Int. Cl.^{3} G03F *7/08;* G03C *5/00*

U.S. Cl. 430—296 **23 Claims**

1. An image-forming method which comprises imagewise exposing a light-sensitive material comprising a support and a light-sensitive composition layer provided on the support, said light-sensitive composition layer consisting of an o-quinonediazide compound as a first component and a basic carbonium dye as a second component, to light to which the o-quinonediazide compound is sensitive, whereby said compound becomes alkali soluble, overall heating the light-sensitive material simultaneously with imagewise exposure or after imagewise exposure to insolubilize the exposed areas, overall exposing the thus-processed material to light to solubilize unexposed areas and then developing with an alkaline developer to provide a negative image by removing alkaline soluble areas of said layer.

11. An image-forming method which comprises imagewise exposing a light-sensitive material comprising a support and a light-sensitive composition layer provided on the support, said light-sensitive composition layer consisting of a binder, an o-quinonediazide compound as a first component and a basic carbonium dye as a second component, to light to which the o-quinonediazide compound is sensitive, whereby said compound becomes alkali soluble, overall heating the light-sensitive material simultaneously with imagewise exposure or after imagewise exposure to insolubilize the exposed areas, overall exposing the thus-processed material to light to solubilize unexposed areas and then developing with an alkaline developer to provide a negative image by removing alkaline soluble areas of said layer.

12. An image-forming method which comprises overall exposing a light-sensitive material comprising a support and a light-sensitive composition layer provided on the support, said light-sensitive composition layer containing an o-quinonediazide compound as a first component and a basic carbonium dye as a second component, to light to which the o-quinonediazide compound is sensitive, imagewise irradiating the light-sensitive materials with a high intensity energy beam after the overall exposure, and then dissolving the light-sensitive composition layer at areas not irradiated by the high intensity energy beam by use of an alkaline developer.

4,356,255

PHOTOSENSITIVE MEMBERS AND A PROCESS FOR FORMING PATTERNS USING THE SAME

Hiromichi Tachikawa; Yohnosuke Takahashi; Fumiaki Shinozaki, and Tomoaki Ikeda, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 30, 1980, Ser. No. 164,399

Claims priority, application Japan, Jun. 28, 1979, 54-81659

Int. Cl.^{3} G03C *5/00, 7/08, 1/495, 1/60, 5/18*

U.S. Cl. 430—325 **1 Claim**

1. An image forming method comprising image-wise exposing with actinic radiation a positive-working and negative-working photosensitive member comprising a photosensitive layer and a support, said photosensitive layer containing an o-benzo- or o-naptho-quinonediazide sulfonic acid ester of a hydroxy compound as a photosensitive agent and an additive selected from a quinone or an aromatic ketone compound, heating said member at about 70° to 300° C. concurrent with or subsequent to exposure to insolubilize the exposed areas, post-exposing said member to actinic radiation to render unexposed areas removable upon development and developing said member with a common alkaline developer to remove unexposed areas, and wherein said quinone compound is selected from the group consisting of anthraquinone, 1-methylanthraquinone, 2-methylanthraquinone, 2-t-butylanthraquinone, 1-acetylamino-4-nitroanthraquinone, 1,2-benzanthraquinone, 2,3-triazoylanthraquinone, phenanthraquinone, 1-methylphenanthraquinone, and benzphenanthraquinone, and wherein said aromatic ketone compound is selected from the group consisting of perinaphthenone, xanthone, thioxanthone, benzanthrone, 3-chlorobenzanthrone, naphthofuranone, 4-phenylnaphthofuranone, indenone, 2,3-diphenylindenone, benzophenone, and benzalacetophenone.

4,356,256

PHOTOGRAPHIC COMPOSITIONS, ELEMENTS AND PROCESSES USING LIGHT-ACTIVATABLE ENZYMES

David F. O'Brien, Rochester, and Patricia N. Tyminski, West Henrietta, both of N.Y., assignors to Eastman Kodak Co., Rochester, N.Y.

Filed Aug. 24, 1981, Ser. No. 295,444

Int. Cl.^{3} G03C *5/24, 1/52*

U.S. Cl. 430—332 **46 Claims**

1. A photographic element comprising a support having thereon at least one layer comprising:

(1) a plurality of vesicles comprising lipid membranes containing rhodopsin;

(2) a mixture of enzymes comprising phosphodiesterase and GTPase;

(3) a first triphosphate nucleotide capable of interacting with GTPase to form a cofactor necessary for the activation of phosphodiesterase;

(4) at least one metal cation selected from the group consisting of Mg^{+2} and Mn^{+2}; and

(5) a second cyclic-monophosphate nucleotide capable of being hydrolyzed to produce a proton, said hydrolysis reaction being catalyzed by activated phosphodiesterase, said phosphodiesterase also being activated by rhodopsin exposed by light in the presence of said cofactor and said metal cation; said element comprising a means for detecting said hydrolysis reaction.

4,356,257

PHOTOSENSITIVE SILVER HALIDE ELEMENT AND METHOD OF PREPARING SAME

Arthur M. Gerber, Boston, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 2, 1981, Ser. No. 298,640
Int. Cl.³ G03C 1/02
U.S. Cl. 430—496 36 Claims

1. A method for forming a photosensitive element comprising a plurality of single effective silver halide grains in a predetermined spaced array which comprises coalescing fine-grain silver halide in a polymeric binder material in a plurality of predetermined spaced depressions in a surface.

34. A photosensitive element comprising a predetermined spaced array of coalesced single effective silver halide grains in a plurality of predetermined spaced depressions in a surface.

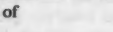
4,356,258

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL CONTAINING YELLOW COUPLER

Tugumoto Usui; Katsunori Kato, both of Hachioji, and Tamotsu Kojima, all of Kokubunji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Japan

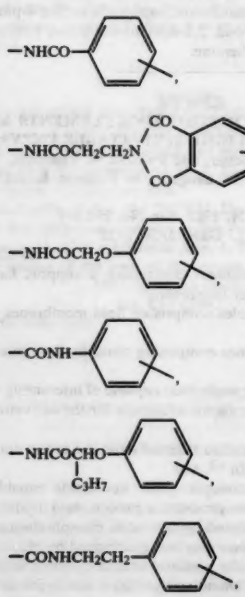
Filed Nov. 21, 1980, Ser. No. 209,030
Claims priority, application Japan, Nov. 21, 1979, 54/151482
Int. Cl.³ G03C 1/40
U.S. Cl. 430—557 1 Claim

1. A color photographic material having a silver halide emulsion layer coated on a support in which the silver halide emulsion layer contains an acylacetanilide yellow coupler having at the acyl or anilide portion thereof a moiety represented by the following formula I:



I

wherein X—Y in the formula I is selected from a group consisting of



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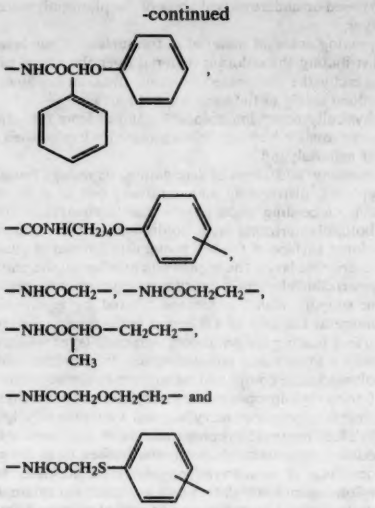
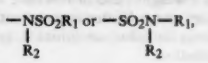
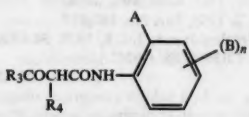


wherein X is —NHCO— or —CONH—, wherein Z is



wherein R_1 is an alkyl or aryl radical, and R_2 is a hydrogen atom or an alkyl or aryl radical, and wherein

a residue of the yellow coupler to which the moiety represented by formula I is attached is represented by the following formula II:



II

wherein the moiety represented by the formula I is attached to R_3 or the benzene ring, R_3 represents an alkyl or aryl radical; A represents a halogen atom, an alkyl radical, an alkoxy radical, or an aryloxy radical; B is a halogen atom, an alkyl radical, an alkoxy radical, or an aryloxy radical; n is 0 or 1; R_4 is a radical separable at the time of the coupling of the oxidized product of developing agents with couplers.

4,356,259

PRESERVING SPERM OF DOMESTIC ANIMALS

Kimio Banba, No. 1000, Orito, Shimizu-shi, Shizuoka-ken, Japan

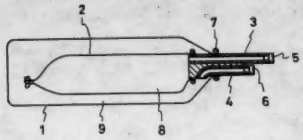
Filed Aug. 15, 1980, Ser. No. 178,480
Claims priority, application Japan, Aug. 27, 1979, 54-108123
Int. Cl.³ A01N 1/02
U.S. Cl. 435—2 8 Claims

1. A method of preserving sperm of domestic animals comprising the steps of:

(i) encapsulating a quantity of sperm in a dialytic tube;

(ii) placing said dialytic tube in a vessel filled with Ringer's solution containing an absorbent selected from the group consisting of
albumin and
activated carbon

whereby a protective buffer layer of said solution surrounds said dialytic tube, and



(iii) maintaining said dialytic tube and said vessel and their contents at a temperature of about 15° C.

4,356,260

ENZYMATIC INDICATOR SYSTEM

Hans B. Elwing, Chalmersgatan 5, 411 35 Gothenburg, Sweden

Continuation of Ser. No. 143,939, Apr. 25, 1980, abandoned, which is a continuation of Ser. No. 23,191, Mar. 14, 1979, abandoned. This application Apr. 9, 1981, Ser. No. 252,473
Claims priority, application Sweden, Jul. 14, 1977, 7708179
Int. Cl.³ C12Q *1/02*
U.S. Cl. 435—29 **6 Claims**

1. A method of determining enzymatic activity comprising
providing a solid surface,
binding a thin layer of an indicator for lysis determination to said solid surface,
applying an immobilized matrix to said thin layer,
supplying a quantity of an enzyme-containing sample to said immobilized matrix,
permitting the enzyme in said enzyme-containing sample to diffuse in said immobilized matrix and react with said thin layer,
removing said immobilized matrix, and
determining the lysis indicated on said solid surface.

4,356,261

ANTI-INVASION FACTOR CONTAINING CULTURES

Klaus E. Kuettner, Chicago, Ill., assignor to Rush-Presbyterian-St. Luke's Medical Center, Chicago, Ill.

Filed Apr. 22, 1980, Ser. No. 142,731
Int. Cl.³ C12N *5/00*; C12P *21/00*
U.S. Cl. 435—68 **4 Claims**

1. A method for culturing chondrocytes to produce cartilage tissue comprising:
selecting mammalian cartilage tissue providing viable chondrocytes,
preparing shavings from the cartilage tissue,
digesting said shavings to remove the extracellular matrix to provide denuded cartilage cells,
plating said denuded cells in a roller bottle in sufficient density to provide at least a monolayer of cells so that said cells are in surface contact with each other, and
providing a growth medium and rotating said roller bottle to grow said cells and produce a culture with an extracellular matrix.

4,356,262

PROCESS FOR THE PRODUCTION OF HIGH FRUCTOSE SYRUPS AND ETHANOL

Robert E. Heady, Park Forest, Ill., assignor to CPC International Inc., Englewood Cliffs, N.J.

Filed Jun. 3, 1980, Ser. No. 156,134
Int. Cl.³ C12P *7/06, 19/04, 19/02*
U.S. Cl. 435—97 **12 Claims**

1. A process for the simultaneous production of ethyl alcohol and fructose polymers which comprises contacting a sucrose-containing substrate at a temperature of about 20° C. to about 35° C. and a pH of about 4.0 to about 6.5 with a mixture of an effective amount of fructosyl transferase enzyme and an effective amount of a yeast preparation, that does not hydrolyze sucrose or fructose polymers or ferment fructose polymers, to produce fructose polymers and ethyl alcohol.

4,356,263

METHOD OF MAKING A POLYSACCHARIDE VACCINE

Dennis L. Kasper, Newton Center, Mass., assignor to President and Fellows of Harvard College, Cambridge, Mass.

Division of Ser. No. 157,859, Jun. 9, 1980, Pat. No. 4,324,887, which is a continuation-in-part of Ser. No. 934,214, Aug. 16, 1978, Pat. No. 4,207,414. This application Oct. 29, 1981, Ser. No. 316,544
Int. Cl.³ C12P *19/04*
U.S. Cl. 435—101 **19 Claims**

1. In a method of making a polysaccharide vaccine against Group B streptococci which comprises culturing the streptococci in a nutrient broth the improvement which comprises introducing into the broth at least 10 g/l of glucose and maintaining the pH of the broth at pH 6–8 to provide polysaccharide antigen including a fraction having a molecular size above 0.8×10^6 d, and recovering said antigen from the broth.

4,356,264

ZINC-CONTAINING ANTIBIOTIC AGENTS

Jerome L. Martin, Terre Haute, Ind., assignor to International Minerals & Chemical Corp., Terre Haute, Ind.

Filed Apr. 11, 1980, Ser. No. 139,597
Int. Cl.³ C12P *17/18*; A61K *31/555*; C12R *1/465*
U.S. Cl. 435—119 **15 Claims**

1. A method for producing a zinc complex of a mono-nitrogen containing divalent pyrrole ether antibiotic, said method comprising:
(a) fermenting a fermentation broth inoculated with a Streptomyces microorganism capable of producing by fermentation of the broth the antibiotic X-14547 for a period of time and under suitable fermentation conditions in order to produce said antibiotic in said fermentation broth;
(b) providing in said antibiotic containing fermentation broth a water-soluble zinc salt in an amount sufficient to form a zinc complex of X-14547, which complex is insoluble in the fermentation broth; and recovering said insoluble zinc complex of X-14547 from said fermentation broth, wherein the fermentation of the inoculated broth is conducted at a temperature of from about 25° C. to 35° C. and at a pH of from about 6.5 to 7.5.

4,356,265

METHOD FOR THE PRODUCTION OF ANTIBIOTIC C-15003 P-3

Kazunori Hatano, Kawanishi; Masanari Nakamichi, Amagasaki, and Shun-ichi Akiyama, Fujisawa, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Nov. 24, 1980, Ser. No. 209,983
Claims priority, application Japan, Dec. 28, 1979, 54-173819
Int. Cl.³ C12P *17/18*
U.S. Cl. 435—119 **6 Claims**

1. A method for producing and accumulating Antibiotic C-15003 P-3 which comprises cultivating a microorganism belonging to the genus Nocardia which is capable of producing Antibiotic C-15003 in a culture medium, said culture medium including a member selected from the group consisting of isobutyl aldehyde, isobutyl alcohol and a fatty acid ester of isobutyl alcohol.

4,356,266

PROCESS FOR THE HYDROLYSIS OF STARCH AND FERMENTABLE HYDROLYSATES OBTAINED THEREFROM

Werner C. Muller, Dobbs Ferry, N.Y., and Franklyn D. Miller, Cincinnati, Ohio, assignors to National Distillers & Chemical Corp., New York, N.Y.

Continuation-in-part of Ser. No. 43,191, May 29, 1979, abandoned. This application Aug. 15, 1980, Ser. No. 178,335

Int. Cl.³ C12P *7/14, 19/14, 19/20*

U.S. Cl. 435—162 26 Claims

1. A process for the hydrolysis of starch to provide an aqueous solution of fermentable sugar which comprises:

(a) liquefying an aqueous slurry of starch in the presence of a liquefying agent selected from the group consisting of strong acid and liquefying enzyme to provide sterile liquefied partially hydrolyzed starch;

(b) partially saccharifying the liquefied partially hydrolyzed starch in a primary saccharification vessel or vessels in the absence of added starch hydrolysate in the presence of a saccharifying enzyme to provide sterile saccharified starch containing from about 60 to about 80 weight percent of the original starch in the form of fermentable sugar, the remaining portion of the starch being present in the form of partial hydrolysate; and,

(c) further saccharifying the partially saccharified starch resulting from step (b) in a secondary vessel or vessels having a total volume of at least $V_2 = V_1 (x/y)$ wherein V_1 is the total volume of the fermentation medium in the primary saccharification vessel or vessels, x is the period of saccharification in the secondary saccharification vessel or vessels and y is the period of saccharification in the primary saccharification vessel or vessels.

4,356,267

ENZYME IMMOBILIZATION IN CELLULOSIC HOLLOW FIBRES

Lanfranco Callegaro, Padova; Antonio Boniolo, Saluggia; Ennio Denti, Pino Torinese; Umberto Rosa, Turin, and Valdano Rossi, San Benedetto Po, all of Italy, assignors to Sorin Biomedica S.p.A., Saluggia, Italy

Filed Feb. 12, 1981, Ser. No. 233,702

Claims priority, application Italy, Feb. 13, 1980, 67212 A/80; Feb. 12, 1981, 67023 A/81

Int. Cl.³ C12N *11/12;* C12M *1/40;* B01D *13/00*

U.S. Cl. 435—179 20 Claims

1. A method for immobilizing an enzyme in a bundle of cellulosic hollow fibres for a fibre-bundle dialyzer for purifying blood, comprising the following sequential steps:

(a) activating said cellulosic hollow fibres by circulating through the lumen of the fibres in the bundle an aqueous solution of sodium periodate at a concentration of 0.7–2.1 mg/ml, at a circulation rate of 300–500 mm^3/minute/mm^2 at a temperature of 15°–30° C. for a period of time not exceeding 70 minutes.

(b) removing excess sodium periodate by circulating through the lumens of the fibres in the bundle deionized water to a total volume amounting to at least 10 times the total volume of the lumens of the fibres, and subsequently circulating a dilute aqueous solution of glycerol to the lumens of the fibres in the bundle; and

(c) directly or indirectly anchoring the enzyme to the activated cellulosic fibres through covalent linkages.

4,356,268

MICROORGANISM FOR TREATING WASTE WATER

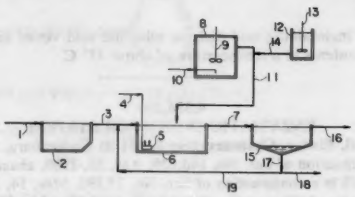
Norio Shimizu; Yoji Odawara, both of Hitachi, and Yasunori Masaki, Yamaguchi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 46,236, Jun. 7, 1979, abandoned. This application Dec. 5, 1980, Ser. No. 213,222

Claims priority, application Japan, Sep. 22, 1978, 53-115813

Int. Cl.³ C12N *1/20*

U.S. Cl. 435—253 6 Claims



1. A biologically pure culture of the microorganism *Alcaligenes faecalis* having the identifying characteristics of ATCC 31529, said culture being:

capable of growth at 10° C.;

incapable of growth at 37° C.;

capable of reducing nitrate to nitrite;

incapable of utilizing nitrate as source of inorganic nitrogen;

incapable of growth at pH 4.95;

capable of hydrolyzing urea; and

capable of forming flocs when mixed with activated sludge in a waste water treatment process.

4,356,269

PLANT FOR THE PRODUCTION OF METHANE

Ove Thomsen, Växjö, and Peter Rönnow, Mölnlycke, both of Sweden, assignors to A-Betone AB, Växjö, Sweden

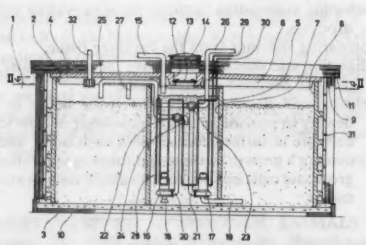
PCT No. PCT/SE79/00041, § 371 Date Nov. 6, 1979, § 102(e) Date Nov. 6, 1979, PCT Pub. No. WO79/00719, PCT Pub. Date Oct. 4, 1979

PCT Filed Feb. 28, 1979, Ser. No. 170,673

Claims priority, application Sweden, Mar. 6, 1978, 7802501-2

Int. Cl.³ C12M *1/02*

U.S. Cl. 435—316 4 Claims



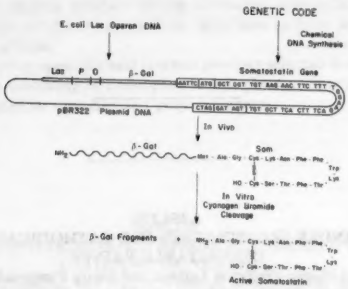
1. An apparatus for the production of methane from a biomass substrate comprising organic materials by culturing and growing therein of anaerobic thermophilic organisms capable of releasing methane from a biomass, comprising a processing chamber (**8, 41**) for enclosing said biomass substrate containing said culture during methane formation; said processing chamber including means (**32, 39**) for collecting and removing the methane formed; and antechamber (**7, 14**) connected to said processing chamber via conduit means (**20, 21, 18, 25, 27, 47*a*, 47*b***); said antechamber including means (**28, 45**) for heating said fresh substrate; pumping means (**16,17, 47**) for transferring heated substrate from said antechamber (**7,40**) to said process-

ing chamber (8, 41) and for mixing and distributing said heated substrate throughout said chambers said pumping means (16, 17, 47) including valve means for directing the discharge of said pumping means between the transfer and introduction of the substrate from said antechamber (40) to said processing chamber (41) and for mixing and distributing by pumping action of said biomass substrates within each of said chambers.

4,356,270
RECOMBINANT DNA CLONING VEHICLE

Keiichi Itakura, Arcadia, Calif., assignor to Genentech, Inc., San Francisco, Calif.

Continuation-in-part of Ser. No. 849,691, Nov. 8, 1977, abandoned. This application Nov. 5, 1979, Ser. No. 91,334
Int. Cl.³ C12N *1/00*
U.S. Cl. 435—317 **9 Claims**



1. A recombinant microbial cloning vehicle comprising a first restriction endonuclease recognition site, a structural gene coding for the expression of the amino acid sequence of a mammalian polypeptide, and a second restriction endonuclease site, at least a majority of the codons of said structural gene being codons preferred for the expression of microbial genomes.

4,356,271
NONCOLLAPSIBLE CERAMIC FOAM

Thomas L. Francis, Murrysville; John E. Marhanka, Delmont, and Raymond P. Heilich, Upper Burrell Township, Westmoreland County, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 153,596, May 27, 1980, abandoned. This application Apr. 16, 1981, Ser. No. 254,926
Int. Cl.³ C04B *21/00*
U.S. Cl. 501—84 **11 Claims**

1. A method for making a stabilized foamed ceramic material suitable for use in making a refractory that is resistant to attack from molten metal, the method comprising the steps of:

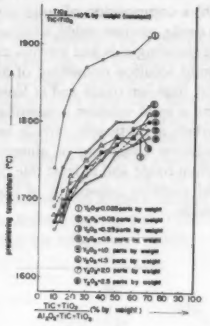
(a) mixing ceramic particles, foaming agent, calcium aluminate cement, and a colloidal bonding material with water for a time sufficient to produce a foamed slurry of constant volume; and

(b) mixing phosphoric acid with said foamed slurry for a time sufficient to produce a foamed slurry of increased constant volume.

4,356,272
SINTERED BODIES AL_2O_3-TIC-TIO_2 CONTINUING YTTRIUM (Y)

Yutaka Kanemitsu, Fukuoka; Takehiko Hagio, Dazaifu; Mitsuhiko Furukawa, Fukuoka; Michito Miyahara, Nakagawa; Yoshimichi Hara, and Takashi Kitahira, both of Fukuoka, all of Japan, assignors to Nippon Tungsten Co., Ltd., Fukuoka, Japan

Filed Mar. 24, 1981, Ser. No. 247,039
Claims priority, application Japan, Mar. 29, 1980, 55-041071
Int. Cl.³ C04B *35/00, 35/10, 35/46, 35/56*
U.S. Cl. 501—87 **6 Claims**



1. A sintered body consisting essentially of:

(1) 100 parts by weight of titanium carbide, titanium oxide and aluminumoxide, said titanium carbide and titamium oxide accounting for 15 to 60 percent by weight and said aluminum oxide accounting for 85 to 40 percent by weight, the amount of said titanium oxide relative to said titanium carbide and titanium oxide being 5 to 15 percent by weight, and

(2) 0.039 to 1.575 parts by weight of yttrium, wherein said yttrium and titanium oxide exist in at least one of the following forms, (a) yttrium oxide, (b) a composition of yttrium oxide and titanium carbide, (c) a composition of yttrium oxide, titanium carbide and yttrium carbide, (d) a double carbide of titanium carbide and yttrium carbide, (e) a solid solution of aluminum oxide, yttrium oxide and titanium oxide, (f) a composition of solid solution consisting of aluminum oxide, yttrium oxide and titanium oxide and a double carbide of titanium carbide and yttrium carbide, (g) a composition of solid solution consisting of aluminum oxide, yttrium oxide and titanium oxide and titanium carbide, (h) a composition of solid solution consisting of aluminum oxide, yttrium oxide and titanium oxide and yttrium carbide, (i) a composition of solid solution consisting of aluminum oxide, yttrium oxide and titanium oxide and a solid solution consisting of titanium oxide, yttrium carbide and titanium carbide and (j) a composition of solid solution consisting of aluminum oxide, yttrium oxide and titanium oxide and a solid solution consisting of titanium carbide and titanium oxide.

4. A sintered body consisting essentially of:

(1) 100 parts by weight of titanium carbide, titanium oxide and aluminum oxide, said titanium carbide and titanium oxide accounting for 15 to 60 percent by weight and said aluminum oxide accounting for 85 to 40 percent by weight, the amount of said titanium oxide relative to said titanium carbide and titanium oxide being 5 to 15 percent by weight,

(2) 0.039 to 1.575 parts by weight of yttrium, and

(3) 0.1 to 1.0 part by weight of at least one sintering aid selected from a group consisting of nickel oxide, molybdenum oxide, chromium oxide, cobalt oxide, magnesium oxide, iron oxide and manganese oxide, wherein said yttrium, titanium oxide and sintering aid exist in at least

one of the following forms, (a) yttrium oxide, (b) a composition of yttrium oxide and titanium carbide, (c) a composition of yttrium oxide, titanium carbide and yttrium carbide, (d) a double carbide of titanium carbide and yttrium carbide, (e) a solid solution of aluminum oxide, yttrium oxide, titanium oxide and at least one of said sintering aids, (f) a composition of solid solution consisting of aluminum oxide, yttrium oxide, titanium oxide and at least one of said sintering aids and a double carbide of titanium carbide and yttrium carbide, (g) a composition of solid solution consisting of aluminum oxide, yttrium oxide, titanium oxide and at least one of said sintering aids and titanium carbide, (h) a composition of solid solution consisting of aluminum oxide, yttrium oxide, titanium oxide and at least one of said sintering aids and yttrium carbide, (i) a composition of solid solution consisting of aluminum oxide, yttrium oxide, titanium oxide and at least one of said sintering aids and a solid solution consisting of titanium oxide, yttrium carbide and titanium carbide and (j) a composition of solid solution consisting of aluminum oxide, yttrium oxide titanium oxide and at least one of said sintering aids and a solid solution consisting of titanium carbide and titanium oxide.

4,356,273

FLUOROCHEMICAL FOAM STABILIZER AND FOAMED POLYURETHANES MADE THEREWITH

Fredrich A. Soch, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 34,383, Apr. 30, 1979, Pat. No. 4,289,892, which is a continuation of Ser. No. 20,113, Mar. 3, 1970, abandoned. This application Dec. 22, 1980, Ser. No. 218,967

Int. Cl.³ C08G *18/14*

U.S. Cl. 521—114 **13 Claims**

1. In a process for preparing a foamed polyurethane, the improvement comprising using a fluoroaliphatic radical-substituted poly(oxyalkylene)polyol as a foam stabilizer, wherein said stabilizer has the formula:

$$(R_f)_m Q_z[(RO)_x H_y]_n$$

where R_f is a fluorinated, saturated, aliphatic radical, R is a saturated aliphatic hydrocarbyl radical, H is an active hydrogen atom, Q is a linkage free of active hydrogen atoms and having a valence of m+n, m and n are integers of at least 1, z is an integer of 1–3, x is an integer of at least 25, y is an integer of at least 1, and the product ny is at least 2.

4,356,274

SMOKE SUPPRESSED RIGID POLYURETHANE FOAM

Stanley R. Sandler, Springfield, and Jeffrey D. Miano, Norristown, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Continuation of Ser. No. 897,617, Apr. 19, 1978, abandoned. This application Apr. 16, 1979, Ser. No. 30,400

Int. Cl.³ C12P *17/14*

U.S. Cl. 521—120 **6 Claims**

1. A rigid polyurethane foam prepared from a reaction mixture which includes a smoke suppressing amount of a compound selected from the group consisting of ferrous 2-mercaptobenzothiazole, cupric 2-mercaptobenzothiazole, ferrous 2,5-dimercapto-1,3,4-thiadiazole, cupric 2,5-dimercapto-1,3,4-thiadiazole, and zinc 2,5-dimercapto-1,3,4-thiadiazole.

4,356,275

AMINOPLAST FOAMS

Kuno Wagner; Manfred Dahm, and Hanns P. Müller, all of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 766,680, Feb. 8, 1977, abandoned. This application Oct. 19, 1981, Ser. No. 312,225

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1976, 2605891

Int. Cl.³ C08L *61/00*; C08G *12/12*

U.S. Cl. 521—136 **3 Claims**

1. An aminoplast foam consisting of a hardened reaction product of an aldehyde and an at least bifunctional modified α,ω-urea having a molecular weight of from 200 to 10,000 and corresponding to the formula

$$R—(O—CO—NH—R'—NH—CO—NH_2)_n$$

in which R represents an n-functional radical which contains at least one of ether, thioether, acetal, ester, ester amide and carbonate groups and has a molecular weight of from 44 to 10,000, and R' represents the radical of an at least bifunctional isocyanate and n is an integer from 2 to 4.

4,356,276

BINDER COMBINATION FOR CATHODICALLY DEPOSITABLE PAINTS

Helmut Hönig; Wolfgang Leitner, and Georg Pampouchidis, all of Graz, Austria, assignors to Vianova Kunstharz, A.G., Werndorf, Austria

Filed Sep. 15, 1981, Ser. No. 302,661

Claims priority, application Austria, Sep. 25, 1980, 4768/80

Int. Cl.³ C08L *63/00*

U.S. Cl. 523—404 **10 Claims**

1. A binder combination for cationically dispositable paints based on modified epoxy resins comprising

(A) 40 to 80% by weight of an epoxy resin having an epoxy equivalent of from 150 to 800, the epoxy groups of which are esterified with equimolar quantities of a member of the group consisting of acrylic acid; methacrylic acid; a semi-ester of a dicarboxylic acid anhydride and mixtures thereof, and a hydroxyalkyl(meth)acrylate, the free hydroxy groups thereof being reacted totally or partially with a reaction product obtained from equimolar quantities of toluene diisocyanate and a dialkanolamine;

(B) 5 to 30% by weight of an epoxy resin having an expoxy equivalent of from 150 to 800, the epoxy groups of which are reacted with equimolar quantities of a member of the group consisting of a dialkylamine, a dialkanolamine and mixtures thereof, the free hydroxy groups thereof being reacted totally or partially with a reaction product of equimolecular amounts of toluene diisocyanate and hydroxyalkyl(meth)acrylate, and

(C) 10 to 40% by weight of an epoxy resin having an epoxy equivalent of between 150 and 800,

30 to 60 mole % of the epoxy groups thereof being reacted with a semi-ester of a dicarboxylic acid anhydride and an N-2-hydroxyalkyloxazolidin, and

10 to 50 mole % of the epoxy groups thereof being reacted with a primary and/or secondary amine, the unconsumed rest being reacted with a saturated and/or unsaturated monocarboxylic acid.

4,356,277

REACTION PRODUCTS OF A POLYGLYCIDYL ETHER OF A POLYPHENOL AND AN AMINO ACID AND AQUEOUS SOLUBILIZED PRODUCTS THEREFROM

William J. Birkmeyer, Oakmont, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 775,490, Mar. 8, 1977, Pat. No. 4,299,747. This application Aug. 28, 1978, Ser. No. 937,378
The portion of the term of this patent subsequent to Nov. 10, 1998, has been disclaimed.
Int. Cl.[3] C08G *8/10, 12/32, 59/14;* C08K *3/20*
U.S. Cl. 523—406 13 Claims

1. An anionic aqueous composition comprising water and

(1) an at least partially based neutralized reaction product of:

(a) a polyglycidyl ether of a polyphenol having a 1,2-epoxy equivalency greater than 1.0; and

(b) an aromatic amino acid selected from the class consisting of anthranilic acid, p-aminobenzoic acid, m-aminobenzoic acid, 3-amino-p-toluic acid, 3-aminosalicylic acid, 3-amino-4-methoxybenzoic acid, 6-amino-m-toluic acid, 3-amino-4-chlorobenzoic acid, 2-amino-5-nitrobenzoic acid, 2-nitro-5-aminobenzoic acid, 5-aminoisophthalic acid;

said reaction product having unreacted carboxylic acid groups which are neutralized with base to form anionic salt groups,

(2) a curing agent for said reaction product selected from the class consisting of aminoplast resins, phenoplast resins or blocked or semi-blocked polyisocyanates.

4,356,278

HEAT-HARDENABLE RESINS SUITABLE FOR CATHODIC DEPOSITION

Wolfgang Daimer, and Heiner Verdino, both of Graz, Austria, assignors to Vianova Kunstharz, A.G., Werndorf, Austria

Filed Oct. 23, 1978, Ser. No. 953,749
Claims priority, application Austria, Nov. 3, 1977, 7830/77
Int. Cl.[3] C08L *63/08*
U.S. Cl. 523—414 10 Claims

1. Aqueous composition suitable for cathodic deposition in an electrodeposition system comprising the neutralized product of the reaction product of an unsaturated diene polymer carrying at least one 1,2-epoxy group per molecule, an amine compound containing amine functionality reactive with an epoxy group, and an alpha,beta-ethylenically unsaturated monomer free from epoxy reactive groups; the homopolymers of said monomer having a glass transition temperature of above about 320° K.

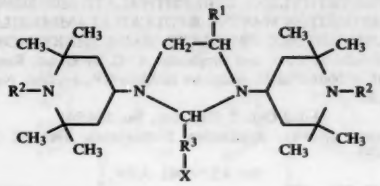
4,356,279

2,2,6,6-TETRAMETHYL-4-PIPERIDYL-SUBSTITUTED HETEROCYCLIC RING COMPOUND AND POLYMERS CONTAINING SAME

Kenneth R. Molt, Cincinnati, Ohio, assignor to Carstab Corporation, Reading, Ohio

Division of Ser. No. 117,878, Feb. 4, 1980, abandoned. This application Jul. 23, 1981, Ser. No. 286,400
Int. Cl.[3] C08K *5/34*
U.S. Cl. 524—102 7 Claims

1. An organic polymer composition comprising an organic polymer normally susceptible to deterioration induced by light, by heat or by a combination of light and heat and a stabilizingly effective amount of a compound having the following formula:



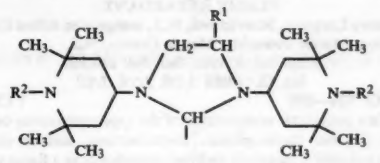
wherein

R^1 is hydrogen or methyl;

R^2 is hydrogen, alkyl having 1 to 8 carbon atoms, unsubstituted aralkyl having 7 to 18 carbon atoms, or aralkyl having 7 to 18 carbon atoms having up to 3 substituents on the aryl ring selected from alkyl having 1 to 4 carbon atoms and alkoxy having 1 to 4 carbon atoms;

R^3 is a straight or branched chain alkylene having 1 to 14 carbon atoms, straight or branched chain alkenylene having 2 to 14 carbon atoms and from 1 to 3 carbon-carbon double bond, unsubstituted arylene having 5 to 7 carbon atoms, or cycloalkylene having 5 to 7 carbon atoms; and

X is a group having the following formula:



where R^1 and R^2 are as defined above.

4,356,280

ADDITIVE DISPERSIONS AND PROCESS FOR THEIR INCORPORATION WITH FIBER-FORMING POLYMERS

Rodney L. Wells, Chester; Monty L. Rowe, Midlothian, both of Va.; Samuel L. Yates, Lexington, S.C., and George R. Muller, Hopewell, Va., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Apr. 15, 1981, Ser. No. 254,348
Int. Cl.[3] C08K *5/09;* D06M *13/00, 13/20*
U.S. Cl. 524—148 39 Claims

1. A dispersion for incorporation with polyamide polymer, said dispersion comprising:

(a) 20 to 80 weight percent of at least one polymer additive having an average diameter of up to 0.5 micron at spinning temperature; and

(b) 20 to 80 weight percent of a glyceride which is non-resin forming when exposed to temperatures of up to 280° C. and pressures of up to 4000 psig (27,600 kPa) for up to 30 seconds, and which has an average molecular weight of between about 600 and 2400.

30. In a process for melt-spinning yarn from fiber-forming polyamide polymer the improvement comprising:

adding to the polymer prior to spinning a dispersion comprising;

20 to 80 weight percent of at least one polymer additive having an average diameter of up to 0.5 micron at spinning temperature; and 20 to 80 weight percent of a glyceride which is non-resin forming when exposed to temperatures up to 280° C. and pressures of up to 4000 psig (27,600 kPa) for up to 30 seconds, and which has an average molecular weight of between 600 and 2400.

31. The process of claim 30 wherein the dispersion is added into the polymer when the polymer is in chip form.

4,356,281

POLYETHYLENE TEREPHTHALATE MOLDING COMPOSITION HAVING REDUCED FLAMMABILITY, AND MOLDED PRODUCTS MADE THEREFROM

Ted Brink, Arnhem, and Stephanus A. G. de Graaf, Renkum, both of Netherlands, assignors to Akzo NV, Arnhem, Netherlands

Filed Oct. 7, 1980, Ser. No. 194,941

Claims priority, application Netherlands, Oct. 8, 1979, 7907435

Int. Cl.³ C08L 5/09

U.S. Cl. 524—397 **16 Claims**

1. A flame retardant polyethylene terephthalate molding composition which contains as flame retardant additive a complex salt of oxalic acid, characterized in that, based on the weight of the total composition, the molding composition contains:

(a) 5–15% by weight of at least one of the oxalic acid salts selected from the group consisting of $K_3[Al(C_2O_4)_3]$, $K_2[Mg(C_2O_4)_2]$ and $Rb_3[Al(C_2O_4)_3]$; and

(b) 0.1–0.5% by weight of polytetrafluoroethylene having a number average molecular weight, $\overline{Mn}$, higher than 10^5.

4,356,282

PHOSPHINE SUPPRESSANTS FOR POLYMERIC COMPOSITIONS INCLUDING RED PHOSPHORUS AS A FLAME RETARDANT

Theodore Largman, Morristown, N.J., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jul. 6, 1981, Ser. No. 280,565

Int. Cl.³ C08K 5/09, 3/16, 3/02

U.S. Cl. 524—398 **7 Claims**

1. In a polymeric composition of the type comprising one or more organic thermoplastic, thermosetting, and/or elastomeric polymeric materials and red phosphorus as a flame retardant, the improvement comprising:

at least about 0.05 weight percent based on the total weight of the composition to suppress phosphine evolution of a phosphine suppressant selected from the group consisting of cuprous chloride, cupric chloride, cuprous acetate, cupric acetate, copper metal and mixture thereof.

4,356,283

VINYL CHLORIDE POLYMER MIXTURES FOR PROCESSING AS PLASTISOLS OR ORGANOSOLS

Jürgen Weinlich, Eppstein; Otto Plewan, Neuötting, both of Fed. Rep. of Germany; Hans-Joachim Leugering, deceased, late of Burgkirchen, Fed. Rep. of Germany; by Ursula M. Leugering nee Wegener, heiress, Hamm, Fed. Rep. of Germany; by Lothar Leugering, heir, Wildeck, Fed. Rep. of Germany; by Manfred Leugering, heir, Frankfurt am Main, Fed. Rep. of Germany; by Rita Bahn nee Leugering, heiress, Liederbach, Fed. Rep. of Germany, and by Günter Leugering, heir, Frankfurt am Main, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed May 11, 1981, Ser. No. 262,172

Claims priority, application Fed. Rep. of Germany, May 17, 1980, 3018940

Int. Cl.³ C08L 27/06, 51/00

U.S. Cl. 524—504 **7 Claims**

1. A process for preparing a plasticized vinyl chloride polymer mixture sufficiently plasticized for processing as a plastisol or organosol, which comprises mixing together a plurality of vinyl chloride polymers with a plasticizer, the resulting plasticized vinyl chloride polymer mixture comprising:

a plasticizing amount of said plasticizer,

a vinyl chloride polymer which is a homopolymer or copolymer, and

5–70% by weight, relative to the total quantity of polymers in the mixture, of another vinyl chloride polymer which is a graft copolymer having a K value of 50 to 80 and an average particle size of 20 to 60 μm and which contains:

99.5 to 88% by weight, relative to the graft copolymer, of polymerized vinyl chloride units,

0.1 to 11.9% by weight, relative to the graft copolymer, of polymerized vinyl acetate units, and

0.1 to 2.2% by weight, relative to the graft copolymer, of polymerized ethylene units, with the proviso that the total of the polymerized units of ethylene and vinyl acetate is 0.5 to 12% by weight, relative to the graft copolymer;

said graft copolymer having been prepared in the presence of at least one oil-soluble activator which decomposes to give free radicals, a suspension stabilizer and an emulsifier, the graft copolymer having been prepared by polymerizing vinyl chloride or a mixture of vinyl chloride and vinyl acetate in the presence of 0.45 to 2.5% by weight, relative to the monomer or mixture of monomers employed, of a copolymer which contains 20 to 80% by weight, relative to the copolymer, of polymerized ethylene units, and which has a molecular weight, determined by osmotic methods, of 5,000 to 200,000.

4,356,284

THERMOPLASTIC COMPOSITIONS CONTAINING POLYVINYLIDENE FLUORIDE AND CHLORINATED POLYETHYLENE

Thomas A. Kutnyak; Mahendra N. Desai, both of Greenwood, S.C., and Roy A. Berman, Ashland, Ohio, assignors to Automation Industries, Inc., Greenwich, Conn.

Filed Oct. 29, 1981, Ser. No. 316,292

Int. Cl.³ C08L 23/28, 27/08

U.S. Cl. 524—520 **8 Claims**

1. A thermoplastic composition comprising an intimate resin admixture of from 50 to 95% of chlorinated polyethylene with from 50 to 5% of polyvinylidiene fluoride by total resin weight.

4,356,285

THERMOSETTING RESIN COMPOSITION

Yugo Kumagai, Hitachi, Japan, assignor to Hitachi Chemical Co., Ltd., Tokyo, Japan

Filed Sep. 21, 1981, Ser. No. 304,063

Claims priority, application Japan, Sep. 19, 1980, 55/131327; Sep. 19, 1980, 55-131329

Int. Cl.³ C08L 63/00, 67/00

U.S. Cl. 525—111 **11 Claims**

1. A thermosetting resin composition which comprises, as the main components, (A) an epoxy group-containing polyester resin obtained by reacting a hydroxy group-containing polyester resin with an epoxy ester resin intermediate having both epoxy and alkyl ester groups, which intermediate being obtained, in turn, by reacting a polyepoxy compound having at least two epoxy groups with a monoalkyl terephthalate, and (B) a hardener containing two or more carboxy groups.

4,356,286

THERMOPLASTIC ELASTOMER BLENDS OF A NITRILE RUBBER AND A CRYSTALLINE POLYAMIDE MIXTURE

Tristram W. Bethea, Akron, and Shingo Futamura, Wadsworth, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Mar. 23, 1981, Ser. No. 246,838

Int. Cl.³ C08L 77/00

U.S. Cl. 525—183 **6 Claims**

1. A process for preparing blends of a nitrile rubber and a crystalline polyamide mixture, comprising the steps of:

obtaining a nitrile rubber, the amount of nitrile component in said nitrile rubber ranging from about 10 percent to about 60 percent by weight, said nitrile component being derived from monomers selected from the group consisting of acrylonitrile, methacrylonitrile, vinylidene cyanide, and fumaronitrile, the diene component of said nitrile rubber being derived from monomers selected from the group consisting of (1) conjugated dienes having from 4 to

10 carbon atoms, (2) at least two conjugated dienes having from 4 to 10 carbon atoms, (3) chloroprene, (4) vinyl substituted aromatic compounds having from 7 to 12 carbon atoms and (a) conjugated diene having from 4 to 10 carbon atoms or (b) chloroprene and combinations thereof;

adding to and blending with said nitrile rubber a crystalline polyamide mixture of a first polyamide having a high melting point and a second polyamide having a lower melting point than said first polyamide, the total amount of said polyamide mixture ranging from about 80 percent to about 20 percent by weight based on said nitrile rubber and the total weight of said polyamides; and,

mixing and heating said nitrile rubber and said polyamide mixture at a temperature below the melting point of said first polyamide having the higher melting point and above the melting point of said second polyamide having said lower melting point to produce a processable thermoplastic elastomer blend, said mixing temperature ranging from 185° to 220° C.

4,356,287

NOVEL POLYMERIC LIGHT STABILIZERS FOR POLYMERS

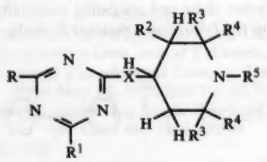
Frank F. Loffelman, Bridgewater, and Thomas E. Brady, Whitehouse Station, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jul. 20, 1981, Ser. No. 284,881

Int. Cl.³ C08F *26/06*; C08L *39/04*

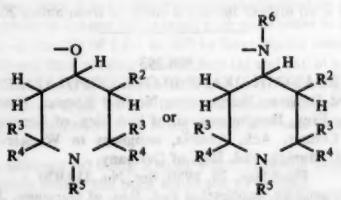
U.S. Cl. 525—204 **12 Claims**

1. A polymer prepared by the polymerization of a monomer, represented by formula (I)

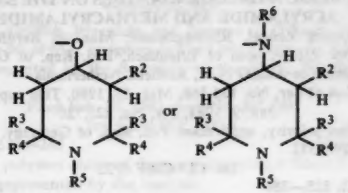


(I)

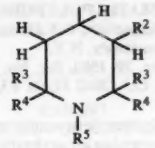
wherein R represents C_3–C_6 alkenyloxy, C_3–C_6 alkenylamino, or di(C_3–C_6 alkenyl)amino; R^1 represents C_1–C_8 alkyl, C_1–C_8 alkoxy, halo, C_1–C_8 alkylthio, C_3–C_6 alkenyloxy, amino, C_3–C_6 alkenylamino, di(C_3–C_6 alkenyl)amino, the groups



wherein R^2, R^3, R^4, R^5, and R^6 are as defined below, C_1–C_{18} alkylamino, C_1–C_{18} dialkylamino, morpholino, piperidino, pyrrolidyl, a substituted C_1–C_{18} alkylamino, or a substituted C_1–C_{18} dialkylamino, wherein the substituents are selected from amino, cyano, carboxy, alkoxycarbonyl wherein the alkoxy moiety has 1 to 8 carbon atoms, and the groups



wherein R^2 represents hydrogen, C_1–C_8 alkyl, or benzyl; R^3 and R^4 independently represent C_1–C_8 alkyl, benzyl, or phenethyl, or together with the carbon to which they are attached form a C_5–C_{10} cycloalkyl; and R^5 represents hydrogen, C_2–C_3 hydroxyalkyl, C_1–C_8 alkyl, hydroxyl, or oxyl; R^6 represents hydrogen, C_1–C_8 alkyl, or



wherein R^2, R^3, R^4, and R^5 are as previously defined; X is oxy, or

wherein R^6 is as previously defined.

7. A method for stabilizing a polymer which is normally subject to degradation by ultraviolet radiation which comprises incorporating into said polymer an ultraviolet stabilizingly effective amount of a polymer of claim **1**.

4,356,288

NOVEL POLYMERS OF ALKYL ACRYLATES

Sheldon N. Lewis, LePlan de Grasse, France, and Richard A. Haggard, Fort Washington, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 17,507, Mar. 5, 1979, Pat. No. 4,246,370, which is a division of Ser. No. 629,186, Nov. 5, 1975, Pat. No. 4,185,736, which is a continuation-in-part of Ser. No. 241,177, Apr. 5, 1972, abandoned. This application May 19, 1980, Ser. No. 151,052

Int. Cl.³ C08F *220/10*

U.S. Cl. 525—308 **9 Claims**

1. A process for preparing a free radical polymerized polymer which comprises the steps of preparing an alkoxide-polymerized addition polymer of at least one ester of acrylic acid wherein the average chain length of the polymer, n, is about 6 to about 30 mers and reacting the alkoxide polymerized polymer with an ethylenically unsaturated monomer under free radical polymerization conditions.

4,356,289

POLYMERIC N-HALOGENOAMIDES ON THE BASIS OF ACRYLAMIDE AND METHACRYLAMIDE

Hans-Georg Zengel, Kleinwallstadt; Manfred Bergfeld, and Rainer Zielke, both of Erlenbach, Fed. Rep. of Germany, assignors to AKZO N.V., Arnhem, Netherlands

Division of Ser. No. 131,368, Mar. 18, 1980. This application Jan. 9, 1981, Ser. No. 223,720

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1979, 2931572

Int. Cl.³ C08F 8/22

U.S. Cl. 525—358 4 Claims

1. A process for making polyfunctional N-chloramide derivatives of homo- or copolymers of acrylamide or methacrylamide comprising chlorinating a homo- or copolymer of acrylamide or methacrylamide by means of chlorine in an dilute aqueous suspension of a mineral acid at a temperature of 0° to 40° C.

4,356,290

BLOCK POLYMERS OF POLYPHENYLENE OXIDE AND AROMATIC POLYFORMALS

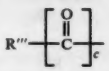
Dwain M. White, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 29, 1980, Ser. No. 220,662

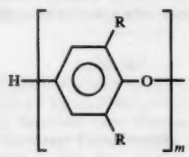
Int. Cl.³ C08G 81/00, 65/38

U.S. Cl. 525—397 7 Claims

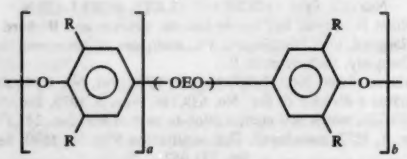
2. A coupled polyphenylene oxide aromatic polyformal block copolymer comprising an acyl radical of the formula:



wherein c is a number at least equal to 2, and R''' is C_{1-8} alkylene, C_{1-8} alkenylene, phenylene, halophenylene and C_{1-18} alkyl substituted phenylene; a polyphenylene oxide radical of the formulas:



wherein independently each R is hydrogen, a hydrocarbon radical, a halohydrocarbon radical, a hydrocarbonoxy radical or a halohydrocarbonoxy radical, m is a number of at least 1, or



wherein independently each —(OEO)— is a divalent quinone residue, E is a divalent arene radical, either a or b is at least equal to 1, the sum of a plus b is at least equal to 10, R is the same as above, and an aromatic polyformal radical of the formula:

wherein n is an integer at least equal to 1, and R' is a divalent aromatic radical.

4,356,291

PURIFICATION AND POLYMERIZATION OF HEXAFLUOROPROPYLENE OXIDE

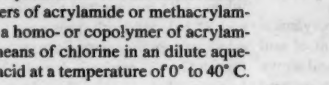
Thomas R. Darling, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 3, 1981, Ser. No. 250,905

Int. Cl.³ C08G 65/22

U.S. Cl. 525—403 22 Claims

1. A polymer of hexafluoropropylene oxide of the formula



wherein

X is COF, COOR, $CONR_2$, H, F, CN, Br, I, CH_2OH, CH_2NR_2, $C(CH_3)_2OH$, COO^-M^+, or CF_2—O—CF_2C-F_2I,

R is hydrogen, alkyl, aryl, or cycloalkyl,

M^+ is a mono-, di-, tri- or tetra-valent metal ion,

R_f is the initiator residue and can be monofunctional or difunctional,

m is an integer greater than 200, and

n is 1 if R_f is monofunctional and 2 if R_f is difunctional.

4,356,292

POLYAROMATIC ETHER-KETO-SULFONES CURABLE BY DIELS-ALDER CYCLOADDITION

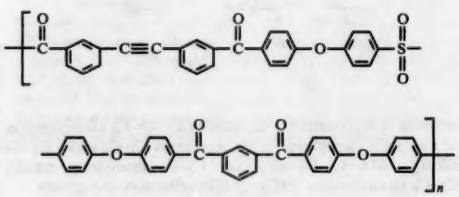
Venkatesa Sankaran, Wilmington, Del., and Carl S. Marvel, Tucson, Ariz., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 20, 1981, Ser. No. 265,521

Int. Cl.³ C08G 75/23

U.S. Cl. 525—419 6 Claims

1. A polyaromatic ether-keto-sulfone containing acetylene units on the polymer chain and consisting essentially of recurring units having the following structural formula:



where n is an integer having a value of from about 20 to 30.

4,356,293

ORGANOSILOXANE BLOCK COPOLYMERS

Bernward Deubzer, Burghausen; Norbert Egerter, Emmerting; Volker Frey, Burghausen, all of Fed. Rep. of Germany, and Kurt Leitner, Ach, Austria, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Nov. 28, 1980, Ser. No. 210,920

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1980, 3003116

Int. Cl.³ C08G 77/44, 77/08

U.S. Cl. 525—477 5 Claims

1. A process for preparing organosiloxane block copolymers which comprises reacting (a) organopolysiloxanes containing Si-bonded hydroxyl groups and having an average molecular weight of at least 800 g/mole in which at least 80 mole-percent

of the siloxane units of the organopolysiloxanes are represented by the formula $RSiO_{3/2}$, where R is an SiC-bonded organic radical and the remaining silicon valences are satisfied by siloxane oxygen atoms or hydroxyl groups with (b) diorganopolysiloxanes having one Si-bonded hydroxyl group in each terminal unit and an average of at least 10 silicon atoms per molecule in which siloxane units other than diorganosiloxane units are present in an amount which does not exceed about 20 mole percent, in the presence of (c) an organic solvent for the organopolysiloxanes and (d) an alkali metal carbonate.

4,356,294

PRODUCTION OF POLYOLEFINS HAVING IMPROVED ESCR

Louis J. Rekers, Wyoming; Richard J. French, Loveland, and Harry W. Mayhew, Cincinnati, all of Ohio, assignors to National Petro Chemicals Corp., New York, N.Y.

Filed Oct. 24, 1980, Ser. No. 200,360
Int. Cl.³ C08F *4/02, 4/24*
U.S. Cl. 526—100 **8 Claims**

1. A method of improving the flexural properties in olefin resins by control of catalyst characteristics comprising polymerizing at least one olefin in the presence of a heat activated chromium containing catalyst system, said catalyst being modified by the incorporation of from about 0.1 to 10% by weight of an aluminum compound reactive with surface hydroxyl on the support said support comprising a controlled, reduced level of silanol groups produced by a drying treatment of a silica xerogel at a temperature of at least about 475° F. for a period of at least 1 hour, prior to interaction with said aluminum compound, said support at the time of interaction with said aluminum compound comprising a controlled selected level of water, in the range of 0.25 to 6.0% by weight of the support, and wherein the weight ratio of water to aluminum compound is 0.025 to 60, and the weight ratio of silanol group content to aluminum compound is 0.55 to 1.10.

4,356,295

PROCESS FOR POLYMERIZING OLEFINS

Masaki Fujii, and Shiro Goto, both of Yokkaichi, Japan, assignors to Mitsubishi Petrochemical Company Limited, Japan

Filed May 30, 1979, Ser. No. 43,732
Claims priority, application Japan, Jun. 5, 1978, 53-67446
Int. Cl.³ C08F *4/02, 10/06*
U.S. Cl. 526—125 **3 Claims**

1. A process for polymerizing propylene which comprises causing an olefin selected from propylene and a mixture of propylene and up to 20% by weight of another olefin to contact a catalyst comprising a combination of a component A and a component B thereby to cause the olefin to polymerize wherein:

said component A is a solid composition obtained by causing constituents (c) and (d) to react with each other in a molar ratio of (c): (d) of 1:1.1 to 500 to form binder constituent (c–d) and then causing constituents (a) and (b), in a weight ratio of (a): (b) of 1:0.01 to 1000 and (c–d) in a weight ratio of (a) to (c–d) of 1:0.005 to 50 to contact each other said binder constituent (c–d) being milled with said constituent (a),

the constituent (a) being a solid which contains magnesium chloride which has been subjected to milling,

the constituent (b) being a halogen containing titanium compound,

the constituent (c) being a halide of aluminum and

the constituent (d) being an organic compound selected from the group consisting of halohydrocarbons, halogen-containing organic acid esters, and alcohols, and

the component B is an organoaluminum compound.

4,356,296

FLUORINATED DIACRYLIC ESTERS AND POLYMERS THEREFROM

James R. Griffith, Riverdale, and Jacques G. O'Rear, Temple Hills, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 25, 1981, Ser. No. 237,838
Int. Cl.³ C08F *14/18*
U.S. Cl. 526—242 **10 Claims**

1. The polymer obtained from polymerizing a fluorodiacrylic ester represented by the formula:

where R represents $-CF_3$ or $-C_2F_5$, R′ represents —H or $-CH_3$, R″ represents —H or $-(CF_2)_nR$, and n is an integer from 1 to 10.

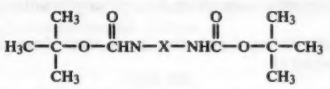
4,356,297

IN-SITU FORMATION OF A DIPRIMARY AMINE CURING AGENT

Yue G. L. Lee, Schenectady, and Charles D. Dudgeon, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 14, 1981, Ser. No. 225,108
Int. Cl.³ C08G *18/30*
U.S. Cl. 528—44 **10 Claims**

1. A composition of matter comprising a urethane of the formula:



wherein X is a divalent hydrocarbon radical of from 2 to 30 carbon atoms, optionally including the group —O—, $-SO_2-$, —S—, and an organic compound containing one or more radicals reactive with a primary amino group.

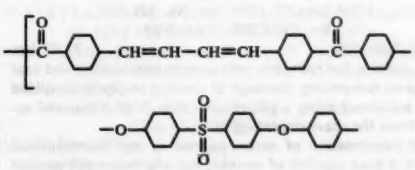
4,356,298

POLYAROMATIC ETHER-KETONE-SULFONES CONTAINING 1,3-BUTADIENE UNITS

Carl S. Marvel, Tucson, Ariz., and Venkatesa Sankaran, Wilmington, Del., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 20, 1981, Ser. No. 265,721
Int. Cl.³ C08G *75/23*
U.S. Cl. 528—173 **2 Claims**

1. A polyaromatic ether-ketone-sulfone containing 1,3-butadiene units and consisting essentially of recurring units having the following structural formula:



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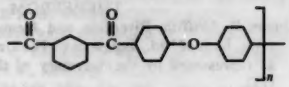


wherein n is an integer of from twenty to thirty.

4,356,299

CATALYST SYSTEM FOR A POLYETHYLENE TEREPHTHALATE POLYCONDENSATION

Michael S. Cholod, Cornwells Heights, Pa., and Nipun M. Shah, Fayetteville, N.C., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Feb. 4, 1982, Ser. No. 345,859
Int. Cl.³ C08G 63/04, 63/34
U.S. Cl. 528—279 24 Claims

1. A polyethylene terephthalate polycondensation catalyst system comprising from about 2 parts to about 18 parts of catalyst metal in the form of an alkyl titanate and from about 40 parts to about 300 parts of catalyst metal in the form of an antimony compound, each of said metals being per million parts of polymer product.

4,356,300

POLYETHERPOLYAMIDE COPOLYMERS

Walter Isler, Paspels, and Eduard Schmid, Bonaduz, both of Switzerland, assignors to Inventa AG fur Forschung und Patentverwertung, Zurich, Switzerland

Filed Feb. 21, 1980, Ser. No. 123,224
Claims priority, application Switzerland, Feb. 26, 1979, 1866/79
Int. Cl.³ C08G 69/14
U.S. Cl. 528—324 8 Claims

1. A thermoplastically processable, flexible polyether polyamide composition comprising the poly-condensation product of

a diamine having a polyether block taken from the class consisting of

$$H_2N—[—(CH_2)_n—O—]_m—(CH_2)_q—NH_2 \quad (I)$$

and

$$H_2N—(CH_2)_3—O—[—(CH_2)_4—O—]_p—(CH_2)_3—NH_2 \quad (II)$$

wherein n and q are individually at least 3, m is 3 to 30, and p is 2 to 30, and

a dicarboxylic acid,

whereby said polyether block is present in an amount of about 8 to about 60% by weight of said composition, said composition further comprising at least one polyamide constituent taken from the class consisting of caprolactam, laurolactam, and aminoundecanoic acid, the sum of all constituents being 100%.

4,356,301

POLYACETYLENE WITH ANTHRAQUINONE SYSTEM

Robert D. Gleim, Newtown, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Dec. 22, 1980, Ser. No. 219,405
Int. Cl.³ C08K 5/42, 3/30
U.S. Cl. 528—487 31 Claims

1. A process for reducing polyacetylene oxidation and embrittlement comprising the steps of treating said polyacetylene with a solution having a pH greater than 7, of a material selected from the class consisting of:

(a) A combination of anthraquinone or an anthraquinone salt, a base capable of maintaining a solution pH greater than 7, and a reducing agent capable of reducing anthraquinone or an anthraquinone salt.

31. A process according to claim 27 wherein said reducing agent is sodium dithionite.

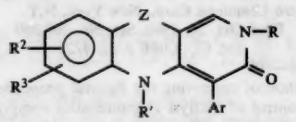
4,356,302

4H-1,4-BENZOTHIAZINE DERIVATIVES

Robert J. Chorvat, Arlington Heights; Bipinchandra N. Desai, Vernon Hills, and Suzanne E. Radak, Wheeling, all of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Filed Mar. 9, 1981, Ser. No. 241,984
Int. Cl.³ C07D 513/14
U.S. Cl. 544—34 24 Claims

1. A compound of the formula



wherein R and R' each represent hydrogen or lower alkyl containing 1 to 4 carbon atoms; R2 and R3 represent hydrogen, halogen, nitro, amino or alkoxy containing 1 to 4 carbon atoms; Z represents sulfur, sulfinyl or sulfonyl; Ar represents phenyl, mono or di substituted phenyl wherein the substituents may be halogen, hydroxy, trifluoromethyl, methoxy, cyano or lower alkyl having 1 to 4 carbon atoms; and pharmaceutically acceptable acid addition salts thereof.

4,356,303

SINGLE STEP PROCESS FOR CYANURIC ACID

John A. Wojtowicz, Cheshire, and Haywood Hooks, Jr., West Haven, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Jul. 2, 1981, Ser. No. 279,653
Int. Cl.³ C07D 251/32
U.S. Cl. 544—192 18 Claims

1. In a process for producing cyanuric acid by the pyrrolysis of a solution of a nitrogen-containing compound selected from the group consisting of urea, biuret and mixtures thereof in a solvent therefore, characterized by the improvement which comprises feeding droplets of said solution into a gas heated to a temperature sufficient to pyrolyze said nitrogen-containing compound to solid particles of cyanuric acid while substantially simultaneously vaporizing said solvent into said gas to form a gaseous mixture, and recovering said cyanuric acid particles.

4,356,304

SYNTHESIS OF OXYALKYLATED POLYAMINO-1,3,5-TRIAZINES

Jeno G. Szita, Norwalk, and Roland R. DiLeone, Rowayton, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 211,889, Nov. 10, 1980, abandoned. This application Jul. 22, 1981, Ser. No. 285,729
Int. Cl.³ C07D 251/18, 251/70
U.S. Cl. 544—196 13 Claims

1. A process for preparing oxyalkylated polyamino-1,3,5-triazines which comprises reacting a hydroxyalkyl (C_2–C_{12}) or hydroxyaryl polyamino-1,3,5-triazine compound with an alkylene oxide at a temperature between about 80° C. and 200° C. in the substantial absence of a solvent.

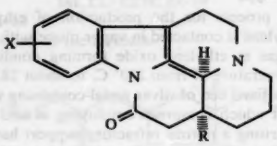
4,356,305

PROCESS FOR THE PREPARATION OF HALOVINCAMONE DERIVATIVES

Csaba Szantay; Lajos Szabo; György Kalaus; Lajos Dancsi; Tibor Keve, and Ferenc Drexler, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

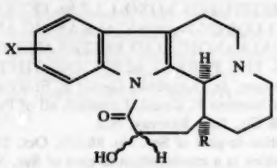
Filed Aug. 5, 1980, Ser. No. 175,384
Claims priority, application Hungary, Aug. 13, 1979, RI 722
Int. Cl.³ C07D *461/00*; A61K *31/435*
U.S. Cl. 546—51 1 Claim

1. A process for the preparation of a halovincamone of the formula (I)



wherein

R is a C_1 to C_6 alkyl group and X is halogen, or an optically active isomer or a pharmaceutically acceptable acid addition salt thereof, which comprises oxidizing at a temperature of 40° to 140° C. a single epimer or an epimer mixture of a racemic or optically active halogenated 14-oxo-15-hydroxy-E-homoeburnane of the formula (II)



or a pharmaceutically acceptable acid addition salt thereof with manganese dioxide precipitated onto an inert support with a large surface area, and if desired, the resulting compound of the formula (I) is converted into a pharmaceutically acceptable acid addition salt thereof and/or resolved.

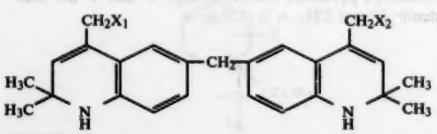
4,356,306

WATER-SOLUBLE DERIVATIVES OF 6,6'-METHYLENE-BIS-(2,2,4-TRIMETHYL-1,2-DIHYDROQUINOLINE)

Vilmos Bür; Joszef Böszörmenyi; Peter Richter; Jenö Mercz, and Tamas Rozsnyai, all of Budapest, Hungary, assignors to Material Vegyipari Szovetkezet and Human Oltoanyagtermelo es Kutato Intezet, both of Budapest, Hungary

Filed Jul. 2, 1980, Ser. No. 164,526
Claims priority, application Hungary, Jul. 6, 1979, MA 3172
Int. Cl.³ C07D *215/12*
U.S. Cl. 546—176 5 Claims

1. A 6,6'-Methylene-bis(2,2,4-trimethyl-1,2-dihydroquinoline) compound of the formula I



(I)

wherein X_1 and X_2 stand for hydrogen, $-SO_3Me$ or $-SO_2NH_2-$

wherein Me represents an alkali metal atom, but that one of X_1 and X_2 is always different from hydrogen.

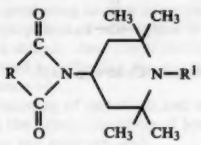
4,356,307

CYCLIC IMIDES, THEIR PREPARATION AND USE

Heike Kelkenberg, Bottrop, and Elmar Wolf, Recklinghausen, both of Fed. Rep. of Germany, assignors to Chemische Werke Hüls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Feb. 17, 1981, Ser. No. 234,609
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1980, 3006272
Int. Cl.³ C07D *401/04*
U.S. Cl. 546—200 5 Claims

1. A cyclic imide of the formula:



wherein R is a saturated or unsaturated, optionally alkyl- or alkenyl-substituted alkylene or cycloalkylene radical having 2–120 C-atoms and R' is selected from the group consisting of hydrogen,

an alkyl radical having 1–20 C-atoms,
an alkenyl radical having 3–5 C-atoms,
an aralkyl radical having 7–12 C-atoms,
$-CH_2-CH_2-CN$,
$-CH_2-CH_2-COO-$alkyl,
$-CH_2-CH(CH_3)-COO-$alkyl,
an acyl radical or
$-(CH_2-CH_2O)_nH$, wherein n is 1–10.

4. The cyclic imide of claim 1, wherein R is selected from the group consisting of 1,2-cyclohexanediyl and methyl-substituted 1,2-cyclohexanediyl radicals.

4,356,308

PROCESS FOR THE PREPARATION OF 2,2,6,6-TETRAMETHYLPIPERIDONE-4

Hartmut Wiezer; Günther Nowy, and Harald Häberlein, all of Gersthofen, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 27, 1981, Ser. No. 248,563
Claims priority, application Fed. Rep. of Germany, Apr. 5, 1980, 3013403
Int. Cl.³ C07D *211/74*
U.S. Cl. 546—242 8 Claims

1. A process for the preparation of 2,2,6,6-tetramethylpiperidone-4 by reaction of acetone with ammonia at elevated temperatures in the presence of a catalyst, wherein the catalyst is a partially halogenated or perhalogenated, aliphatic or cyclic hydrocarbon which is liquid or solid at room temperature and has from 1 to 28 or 5 or 6 carbon atoms, respectively; these carbon atoms, in the case where their number is from 2 to 6, may also be linked to one another by nonpolymerizable double bonds.

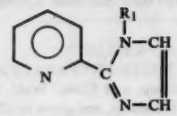
4,356,309

N-ALKYLATED 2-(2-PYRIDYL)IMIDAZOLES USEFUL AS METALLURGICAL EXTRACTANTS

James W. Lalk, Shepherd, and Frances P. Hamburg, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 13, 1981, Ser. No. 282,628
Int. Cl.³ C07D *401/04*
U.S. Cl. 546—278 6 Claims

1. A compound of the formula



(I)

wherein R_1 represents

C_1 to C_{20} alkyl-substituted benzyl, or

C_{12} to C_{20} alkyl which can optionally bear one or two $-OR_2$ radicals, wherein each R_2 independently represents hydrogen or the radical

wherein R_3 represents C_1 to C_{20} alkyl.

4,356,310

PROCESS FOR PREPARING GAMMA-BUTYROLACTONE AND BUTENOLIDE

Thomas S. Brima, Cincinnati, Ohio, assignor to National Distillers & Chemical Corp., New York, N.Y.

Filed Jul. 2, 1981, Ser. No. 280,168

Int. Cl.³ C07D *307/58, 307/32*

U.S. Cl. 549—295 **9 Claims**

1. A process for preparing a mixture of gamma-butyrolactone and butenolide which comprises reacting 1,3-butadiene with oxygen in the vapor phase at elevated temperature in the presence of a catalytically effective amount of a mixed metal oxide catalyst containing boron, molybdenum and titanium values said mixed metal oxide catalyst being obtained by:

(a) reacting a titanium halide with boric acid;

(b) reacting the titanium and boron-containing reaction product of step (a) with ammonium heptamolybdate to provide a titanium, boron and molybdenum-containing solid; and,

(c) calcining the solid obtained in step (b) to provide said catalyst.

4,356,311

PRODUCING EPOXIDE FROM OLEFIN USING METAL NITRO COMPLEXES

Steven E. Diamond, New Providence; Frank Mares, Whippany; Deborah A. Muccigrosso, Somerville, and Jeffrey P. Solar, Flanders, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Dec. 21, 1981, Ser. No. 332,782

Int. Cl.³ C07D *301/03*

U.S. Cl. 549—524 **10 Claims**

1. A process of producing an oxirane compound which comprises reacting in the liquid phase a transition metal nitro complex, having the transition metal bonded to the nitrogen atom of the nitro radical, with an olefinically unsaturated substrate free of easily oxidizable groups, in the presence of a thallium(III) compound.

4,356,312

ETHYLENE OXIDE PROCESS

Robert P. Nielsen, Houston, Tex., and John H. La Rochelle, Baton Rouge, La., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 3,156, Jan. 15, 1979, abandoned, which is a continuation of Ser. No. 621,267, Oct. 10, 1975, abandoned, which is a continuation-in-part of Ser. No. 480,896, Jun. 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 317,349, Dec. 21, 1972, abandoned, which is a continuation-in-part of Ser. No. 216,188, Jan. 7, 1972, abandoned. This application Mar. 22, 1979, Ser. No. 22,750

Int. Cl.³ C07D *301/10*

U.S. Cl. 549—534 **25 Claims**

1. In the process for the production of ethylene oxide wherein ethylene is contacted in vapor phase with an oxygen-containing gas at ethylene oxide forming conditions at an elevated temperature of from 210° C. to about 285° C. in the presence of a fixed bed of silver metal-containing catalyst, the improvement which comprises employing as said catalyst an article comprising a porous refractory support having deposited on its exterior and pore surfaces from about 2% by weight to about 20% by weight of silver and, coincidentally deposited with silver, a total of from about 3.0×10^{-4} gew per kilogram of total catalyst to about 3.2×10^{-3} gew per kilogram of total catalyst of alkali metal present in final form on the support in the form of an oxide in which the said oxide consists of the oxide of potassium.

4,356,313

[(5,6,9a-SUBSTITUTED-3-OXO-1,2,9,9a-TETRAHYDRO-3H-FLUOREN-7-yl)OXY]ALKANOIC AND CYCLOALKANOIC ACID ESTERS AND THEIR ANALOGS, THE PARENT ACIDS AND THEIR SALTS

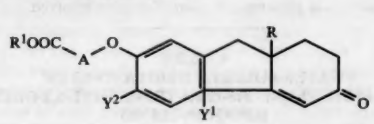
Edward J. Cragoe, Jr., Lansdale; Gerald E. Stokker, Gwynedd Valley, and Norman P. Gould, Lansdale, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 86,626, Oct. 19, 1979, abandoned, which is a continuation-in-part of Ser. No. 164,704, Jun. 30, 1980, abandoned. This application Feb. 19, 1981, Ser. No. 235,376

Int. Cl.³ C07C *69/94*

U.S. Cl. 560—53 **16 Claims**

1. A compound of the formula:



wherein R is C_3 to C_6 cycloalkyl and C_3 to C_6 cycloalkyl C_1 to C_4 alkyl, branched or unbranched; R^1 is H, lower alkyl; lower alkenyl; lower alkynyl; lower cycloalkyl; substituted lower alkyl, where the substituent is carboxy, lower alkoxycarbonyl, oxo, hydroxy, lower alkoxy, halo, lower acyloxy, lower dialkylamino, sulfamoyl, pyridyl, furyl, tetrahydrofuryl, aryl, 1-methylpiperidyl, morpholinyl, pyrrolidinyl, 1-methylpiperazinyl, and thienyl; substituted cycloalkyl; a heterocyclic moiety selected from the group consisting of imidazolyl, pyridyl, thiazolyl, pyrazinyl, and furyl; aryl; Y^1 and Y^2 are independently Cl and CH_3; A is $(CH_2)_2$ or

where R^2 is H, methyl or ethyl, R^3 is H, F or methyl and R^2 and R^3, may be joined together to form the ring $>C(CH_2)_n$

where n is the integer 2, 3, or 4; and pharmaceutically acceptable salts thereof.

4,356,314

[5,6,9A-SUBSTITUTED-3-OXO-1,2,9,9A-TETRAHYDRO-3H-FLUOREN-7-YL)OXY]ALKANOIC AND CYCLOALKANOIC ACIDS, THEIR ANALOGS, ESTERS, SALTS, AND DERIVATIVES

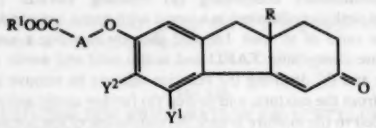
Edward J. Cragoe, Jr., Lansdale; Gerald E. Stokker, Gwynedd Valley, and Norman P. Gould, Lansdale, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 164,754, Jun. 30, 1980, and a continuation-in-part of Ser. No. 86,625, Oct. 19, 1979. This application Feb. 19, 1981, Ser. No. 236,076

Int. Cl.³ C07C *69/94*

U.S. Cl. 560—53 **15 Claims**

1. A compound of the formula:



wherein

R is C_2 to C_4 alkenyl, branched or unbranched; R^1 is H, lower alkyl, lower alkenyl, loweralkynyl, lower cycloalkyl; substituted lower alkyl, where the substituent is carboxy, lower alkoxycarbonyl, oxo, hydroxy, lower alkoxy, halo, lower acyloxy, lower dialkylamino, sulfamoyl, pyridyl, furyl, tetrahydrofuryl, aryl, 1-methylpiperazinyl, and thienyl; substituted cycloalkyl; a heterocyclic moiety selected from the group consisting of imidazolyl, pyridyl, thiazolyl, pyrazinyl, and furyl; and aryl;

Y^1 and Y^2 are independently Cl and CH_3;

A is $(CH_2)_2$ or

where R^2 is H, methyl or ethyl, R^3 is H, F or methyl and R^2 and R^3, may be joined together to form the ring $>C(CH_2)_n$ where n is the integer 2, 3 or 4; and pharmaceutically acceptable salts thereof.

4,356,315

CARBOXYPHENYLALKANOIC ACIDS AND LOWER ALKYL ESTERS THEREOF

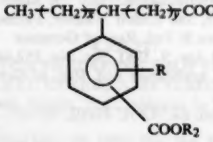
Irwin S. Schlossman, Cincinnati, Ohio, assignor to Emery Industries, Inc., Cincinnati, Ohio

Filed Mar. 20, 1981, Ser. No. 245,466

Int. Cl.³ C07C *69/612, 69/773, 55/28*

U.S. Cl. 560—81 **9 Claims**

1. A compound having the formula



wherein

R represents hydrogen, a carboxyl group or a C_{1-4} alkyl group;

R_1 and R_2 are the same or different and are each selected from the group consisting of hydrogen or C_{1-4} alkyl; and x and y are positive integers such that x+y equals from 5 to 23.

4,356,316

PROCESS FOR PRODUCING UNSATURATED CARBOXYLIC ESTERS

Atsushi Aoshima, Yokohama, and Toshiaki Murofushi, Fuji, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Feb. 23, 1981, Ser. No. 236,956

Claims priority, application Japan, Mar. 5, 1980, 55-26759; Apr. 22, 1980, 55-53154

Int. Cl.³ C07C *67/39*

U.S. Cl. 560—208 **18 Claims**

1. A process for producing an ester of acrylic or methacrylic acid by oxidizing propylene or isobutylene in the liquid phase in the presence of a straight chain lower alcohol and molecular oxygen, characterized by effecting the reaction at 150° C. or below in the presence of

(1) a catalyst consisting of palladium and at least one metal selected from the group consisting of lead, bismuth, thallium, tellurium and mercury, and

(2) at least one compound selected from the group consisting of mineral acids, heteropoly-acids, heteropoly-acid salts, molybdic acid and organic sulfonic acids.

4,356,317

ACYLOXYALKENOIC ACIDS AND PROCESS THEREFOR

James P. Coleman; Richard C. Hallcher, both of Maryland Heights, and Dudley E. McMackins, St. Charles, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Jan. 2, 1981, Ser. No. 222,200

Int. Cl.³ C07C *67/05*

U.S. Cl. 560—241 **27 Claims**

1. A process for preparing acyloxy-alkanoic acids which comprises reacting lower alkanoic acid having at least one replaceable hydrogen atom on the alpha carbon atom and butadiene in the presence of lower alkanoic acid anhydride and one or more metal oxidants in a valence higher than its lowest positive valence and selected from manganese, vanadium and cerium at an elevated temperature to produce such acyloxyhexenoic acids, utilizing the metal ion oxidant in an amount less than stoichiometric with respect to butadiene and repeatedly electrolytically regenerating and utilizing the higher valent state of the ion during the course of the reaction.

4,356,318

TOLUIC ACID

Francis J. Waller, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 174,920, Aug. 4, 1980, abandoned, which is a continuation-in-part of Ser. No. 108,819, Dec. 31, 1979, abandoned. This application Dec. 15, 1980, Ser. No. 215,712

Int. Cl.³ C07C *51/145*

U.S. Cl. 562—406 **26 Claims**

1. Process for oxidatively carbonylating toluene to toluic acid, at least 50 mol % of the toluic acid being the p-isomer, said process comprising contacting and reacting, at 110°–250° C., at a pressure of at least 500 psi (3.45 MPa), toluene, carbon monoxide, oxygen and the catalyst ingredients consisting essentially of

(a) a compound of rhodium, iridium, ruthenium, platinum, palladium or osmium;

(b) a sulfur oxy-acid or a Group Ia or IIa metal salt of a sulfur oxy-acid; and

(c) an acid or acid mixture having a Hammett acidity value ($-H_0$) of greater than 7.0,

said catalyst ingredients containing 0.5–30 mol % of (a) and

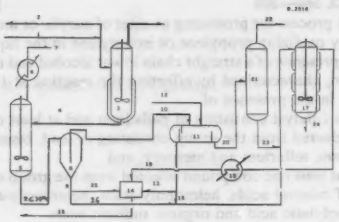
70–99.5 mol % of (b+c), with the molar ratios of (b/a) and (c/a) each being at least 2, and recovering toluic acid.

4,356,319

METHOD OF RECOVERING IN ACTIVE FORM THE CATALYST FOR THE TEREPHTHALIC ACID SYNTHESIS

Paolo Roffia, Saronno; Pierangelo Calini, Rho, and Sergio Tonti, Venezia Mestre, all of Italy, assignors to Montedison, S.p.A., Milan, Italy

Filed Jan. 19, 1981, Ser. No. 226,382
Claims priority, application Italy, Jan. 23, 1980, 193393 A/80
Int. Cl.³ C07C *51/29, 51/265;* B01J *31/40*
U.S. Cl. 562—414 8 Claims



1. A method of recovering in active form the catalyst used in the synthesis of terephthalic acid from the dehydrated acetic mother liquor which comprises the steps of:

(a) removing from said mother liquor by evaporation from 70 to 90% of the acetic acid contained therein;

(b) cooling the concentrate to a temperature below 60° C.;

(c) recovering the resulting precipitate, which contains substantially all the residual terephthalic acid product, for recycle to the synthesis zone;

(d) subjecting the remaining liquid phase, which contains organic impurities, to extraction with water or with aqueous-acetic acid solutions, at a temperature of from 20° to 80° C. and in the presence of a coadjuvant in an amount by weight of 0.5 to 2.5 times the amount of said liquid phase and selected from the group consisting of p-xylene, isobutyl acetate and secondary butyl acetate;

(e) separating the heavy aqueous phase, which contains substantially all the catalyst to be recovered, from the lighter organic phase, which contains said organic impurities, and recovering said aqueous phase for recycle to the synthesis zone.

6. A method according to claim 1, characterized in that an amount equal to or higher than 50% of the solid phase which separates, in consequence of cooling, is directly recycled to the terephthalic acid synthesis.

8. A method according to claim 1, characterized in that the coadjuvant is added in admixture with H_2O.

4,356,320

PREPARATION OF CARBOXYLIC ACIDS

Anthony N. Naglieri, Pine Brook, and Nabil Rizkalla, River Vale, both of N.J., assignors to The Halcon SD Group, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 740,146, Nov. 8, 1976, abandoned. This application Oct. 6, 1977, Ser. No. 839,948
Int. Cl.³ C07C *51/12*
U.S. Cl. 562—519 5 Claims

1. A process for the preparation of a monocarboxylic acid which comprises reacting carbon monoxide and a hydrocarbyl alcohol in the presence of an iodide and in the presence of a catalyst consisting essentially of nickel or a nickel compound and a phosphine promoter, said iodide being employed in the amount of 10 to 200 mols, expressed as I, per 100 mols of alcohol, and said reacting being carried out at a temperature of 25°–350° C. and at a carbon monoxide partial pressure of 1–10,000 psi.

4,356,321

PRODUCTION OF N,N,N',N'-TETRAACETYLETHYLENEDIAMINE

Stephen J. Hannam, Clwyd, Wales, assignor to Warwick Chemical Limited, Leeds, England

Continuation of Ser. No. 214,403, Dec. 8, 1980. This application Feb. 8, 1982, Ser. No. 346,680
Claims priority, application United Kingdom, Jun. 27, 1980, 8021142
Int. Cl.³ C07C *102/00, 102/04*
U.S. Cl. 564—144 9 Claims

1. A process for making TAED (N,N,N',N'-tetraacetylethylenediamine) comprising (a) reacting DAED (N,N'-diacetylethylenediamine) in a vessel with acetic anhydride, at a molar ratio of at least 1:6, and thereby forming a reaction mixture comprising TAED and acetic acid and acetic anhydride and (b) distilling the reaction mixture to remove acetic acid from the mixture, and in step (b) further acetic anhydride is added to the mixture before the distillation of the acetic acid is complete and the distillation of acetic acid is thereafter continued.

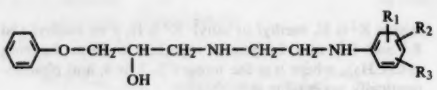
4,356,322

PHENOXYALKANOLAMINE DERIVATIVES

Dieter Lehmann; Klaus Femmer, and Gottfried Faust, all of Radebeul, German Democratic Rep., assignors to Veb Arzneimittelwerk Dresden, Radebeul, German Democratic Rep.

Continuation-in-part of Ser. No. 963,960, Nov. 27, 1978, abandoned. This application Mar. 24, 1980, Ser. No. 133,128
Claims priority, application German Democratic Rep., Dec. 1, 1977, 202331
Int. Cl.³ C07C *93/06, 91/16*
U.S. Cl. 564—185 20 Claims

1. A compound of the general formula:



I

and salts thereof with physiologically compatible inorganic or organic acids, wherein R_1, R_2 and R_3 are the same or different and are hydrogen, alkyl of 1 to 2 C atoms, methoxy, halogen, amino, nitro or acylamino residues.

4,356,323

PROCESS FOR THE PRODUCTION OF 1-AMINO-PROPANEDIOL-(2,3) (I)

Axel Kleemann, Greifenhagenstrasse 25; Robert Nygren, Furstenbergstrasse 8, and Rudolf Wagner, Furstenbergstrasse 6, all of 6450 Hanau 9, Fed. Rep. of Germany

Filed Apr. 9, 1981, Ser. No. 252,460
Claims priority, application Fed. Rep. of Germany, Apr. 12, 1980, 3014098
Int. Cl.³ C07C *89/02, 91/10*
U.S. Cl. 564—475 13 Claims

1. In a process for the production of 1-amino-propanediol-2,3 by the reaction of glycidol with ammonia the improvement comprising reacting glycidol and liquid ammonia under pressure sufficient to keep the ammonia in liquid form.

4,356,324

OPTICALLY ACTIVE 1,2-BIS-(DIPHENYLPHOSPHINE)-COMPOUNDS

Wolfgang Bergstein, Lindenstrasse 10, 6458 Rodenbach 1; Axel Kleemann, Greifenhagenstrasse 9, 6450 Hanau 9, and Jurgen Martens, Hochstrasse 5, 8755 Alzenau, all of Fed. Rep. of Germany

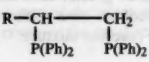
Filed Dec. 31, 1980, Ser. No. 221,915

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1980, 3000445

Int. Cl.³ C07F 9/50

U.S. Cl. 568—17 4 Claims

1. An optically active 1,2-bis-(diphenylphosphino)-compound of the formula



in which Ph is a phenyl group and R is isopropyl, isobutyl, sec.butyl or a benzyl group.

4,356,325

PROCESS FOR PREPARATION OF ACETYLENE TERMINATED SULFONES, OLIGOMERS AND PRECURSORS THEREFOR

James J. Harrison, Glenshaw; Edward T. Sabourin, Allison Park, and Charles M. Selwitz, Monroeville, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Nov. 28, 1980, Ser. No. 211,318

Int. Cl.³ C07C 147/10, 147/12, 147/06

U.S. Cl. 568—33 145 Claims

1. A process for the production of an acetylene terminated sulfone which comprises:

(a) reacting a sulfonyldiphenol with a material selected from the group consisting of a meta-dibromobenzene, a para-dibromobenzene and mixtures thereof in the presence of a potassium base to form a bis-bromophenoxydiphenyl sulfone;

(b) reacting said bis-bromophenoxydiphenyl sulfone with a substituted terminal acetylene compound containing at least three carbon atoms and an hydroxy group on the carbon atom adjacent to the acetylene group to form the corresponding hydroxy-acetylene terminated phenoxydiphenyl sulfone; and

(c) subjecting said hydroxy-acetylene terminated phenoxydiphenyl sulfone to base catalyzed cleavage to form the corresponding acetylene terminated sulfone.

4,356,326

PROCESS FOR PRODUCING 3-OXOCYCLOPENTENES

Kenji Saito, Sonehigashi, and Hiroshi Yamachika, Osaka, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Dec. 5, 1980, Ser. No. 213,632

Claims priority, application Japan, Dec. 6, 1979, 54-158817; May 16, 1980, 55-65771

Int. Cl.³ C07C 45/47, 49/573

U.S. Cl. 568—322 3 Claims

1. 2-Propargyl-3-hydroxy-3-methyl-4-cyclopentenone.

4,356,327

PROCESS FOR PREPARING PROPYLENE GLYCOL MONOALKYL ETHERS AND ALKOXYACETONES

John F. Knifton, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Oct. 29, 1981, Ser. No. 316,193

Int. Cl.³ C07C 45/49, 41/01

U.S. Cl. 568—387 16 Claims

1. A process for preparing propylene glycol monoalkyl ethers and alkoxyacetones which comprises reacting a mixture of hydrogen, carbon monoxide, a material selected from the group consisting of (a) acetaldehyde and (b) an acetal of the formula:

$$(R'O)_2CHCH_3$$

wherein R′ is an alkyl radical of from 1 to 10 carborn atoms, and an alcohol of the formula:

$$ROH,$$

wherein R is an alkyl radical of from 1 to 10 carbon atoms, in the presence of a catalyst comprising a cobalt-containing compound and a promoter selected from the group consisting of tin- and germanium-containing compounds at superatmospheric pressures of about 500 psi or greater and at a temperature of from about 50° to about 350° C.

4,356,328

PROCESS FOR THE PREPARATION OF ACETALDEHYDE

David Moy, Ridgewood, N.J., assignor to The Halcon SD Group, Inc., New York, N.Y.

Filed Oct. 6, 1980, Ser. No. 194,324

Int. Cl.³ C07C 47/06

U.S. Cl. 568—484 4 Claims

1. A process for the preparation of acetaldehyde which comprises reacting acetic anhydride with hydrogen in the presence of a supported Group VIII noble metal catalyst wherein the reaction is carried out in the vapor phase, whereby acetaldehyde is produced with high selectivity and the formation of ethylidene diacetate is minimized.

4,356,329

HYDROQUINONE ETHERS HAVING JUVENILE HORMONE ACTIVITY

Franco Bettarini, Novara; Pietro Massardo, Milan; Paolo Piccardi, Milan, and Angelo Longoni, Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

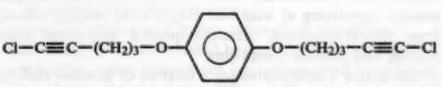
Continuation-in-part of Ser. No. 50,335, Jun. 20, 1979, abandoned. This application Oct. 20, 1980, Ser. No. 198,488

Claims priority, application Italy, Jun. 21, 1978, 24794 A/78; Mar. 5, 1979, 20734 A/79

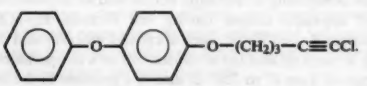
Int. Cl.³ C07C 43/215

U.S. Cl. 568—637 5 Claims

1. Hydroquinone diethers selected from 1,4-di-(5-chloro-4-pentinyloxy)-benzene of formula



and 1-(5-chloro-4-pentinyloxy)-4-phenyloxybenzene of formula



4,356,330

METHOD OF DECOLORIZING MIXTURES OF T-BUTYL ALKYLPHENOLS WITH N-(2-HYDROXYETHYL)OXAZOLIDINE

Michael Cuscurida, and George P. Speranza, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jul. 20, 1981, Ser. No. 284,905
Int. Cl.[3] C07C 37/68
U.S. Cl. 568—756 3 Claims

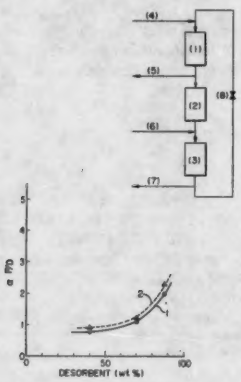
1. A method for removal of color-forming bodies from a mixture of t-butyl nonylphenols derived by reacting isobutylene with nonylphenol comprising reacting the mixture with N-(2-hydroxyethyl) oxazolidine in proportions of 1 to 5 weight percent of the mixture at a temperature in the range of 25° to 150° C.

4,356,331

PROCESS FOR SEPARATING AN ALKYLPHENOL ISOMER

Takehisa Inoue, Tokyo, and Kishio Miwa, Kamakura, both of Japan, assignors to Toray Industries, Incorporated, Japan

Filed Sep. 12, 1980, Ser. No. 186,480
Claims priority, application Japan, Sep. 20, 1979, 54-120085
Int. Cl.[3] C07C 37/82, 37/70
U.S. Cl. 568—758 12 Claims



1. An adsorptive-separation process for a mixture of monoalkylphenol isomers selected from the group consisting essentially of a mixture containing at least two cresol isomers selected from para-cresol, meta-cresol and ortho-cresol, and a mixture containing at least two ethylphenol isomers selected from para-ethylphenol, meta-ethylphenol, and ortho ethylphenol, said process comprising:

(i) contacting a feed containing a mixture of monoalkylphenol isomers with a faujasite type Y zeolite containing potassium cations adsorbent; and

(ii) contacting said faujasite type Y zeolite containing potassium cations adsorbent resulting from step (i) with a desorbent comprising an aliphatic ketone and an aliphatic alcohol, said aliphatic ketone having the formula R_1—CO—R_2, wherein R_1 and R_2 are each alkyl and wherein said contacting in steps (i) and (ii) is carried out at a temperature in the range of from 0° to 350° C. and at a pressure in the range of from atmospheric to 40 kg/cm^2.

4,356,332

PROCESS FOR PREPARING ETHYLENE GLYCOL

John F. Knifton, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Oct. 29, 1981, Ser. No. 316,197
Int. Cl.[3] C07C 31/20
U.S. Cl. 568—852 19 Claims

1. A process for preparing ethylene glycol which comprises reacting a mixture of hydrogen, carbon monoxide and formaldehyde in the presence of a catalyst comprising a cobalt-containing compound and a promoter selected from the group consisting of a tin-containing compound and a germanium-containing compound and in the presence of a substantially inert oxygenated hydrocarbon solvent at superatmospheric pressures of about 500 psi or greater until substantial formation of the said ethylene glycol has been achieved and recovering the said glycol from the reaction mixture.

4,356,333

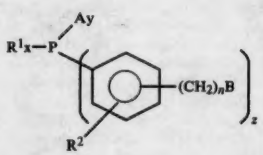
PROCESS FOR PREPARING N-OCTADIENOL

Noriaki Yoshimura, and Masuhiko Tamura, both of Kurashiki, Japan, assignors to Kuraray Company, Limited, Kurashiki, Japan

Filed Mar. 25, 1981, Ser. No. 247,290
Claims priority, application Japan, Mar. 28, 1980, 55-40989; Apr. 11, 1980, 55-48256; Jan. 26, 1981, 56-10560
Int. Cl.[3] C07C 29/00
U.S. Cl. 568—840 22 Claims

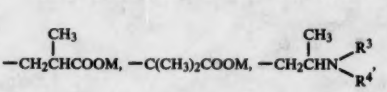
1. A process for preparing n-octadienol, comprising the steps of:

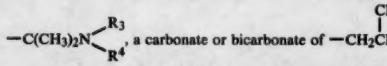
(i) reacting at a temperature of 10° C. to 150° C. butadiene with water in an aqueous sulfolane solution having a water/sulfolane weight ratio in the range of 20/80 to 70/30 and containing carbonate ions, bicarbonate ions or mixtures thereof, in the presence of (A) palladium or a palladium compound, (B) a monodentate phosphine of the formula:



(I)

wherein R^1 is an aliphatic, alicyclic or substituted or unsubstituted aromatic hydrocarbon group having 1 to 8 carbon atoms; R^2 is hydrogen, methyl, nitro, cyano, methoxy, or halogen; n is 0 or 1, x is 0, 1 or 2, and y and z are each 0, 1, 2 or 3, with the proviso that y and z are not concurrently equal to 0 and that x+y+z=3; A is





or a carbonate or bicarbonate of —C(CH$_3$)$_2$N(R^3)(R^4'),

and B is —SO$_3$M, —COOM, —N(R^3)(R^4) or a carbonate or

-continued

bicarbonate of

wherein R^3 and R^4 are each methyl, ethyl or n-propyl and M is an alkali metal in an amount of at least 6 moles per gram atom of said palladium; and (C) a monodentate tertiary amine having a basicity constant (pKa) of at least 7 in an amount of 1 to 50% by volume based on the sulfolane to form n-octadienol;

(ii) extracting at least part of the reaction mixture obtained in step (i) with a saturated aliphatic hydrocarbon, a monoolefinic hydrocarbon or an alicyclic hydrocarbon; and

(iii) recycling at least part of the extraction residue obtained in step (ii) which contains the catalyst components to step (i).

4,356,334
SYNTHESIS OF ALCOHOLS

Tamotsu Imai, Mount Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 113,880, Jan. 21, 1980, abandoned, which is a continuation-in-part of Ser. No. 39,633, May 16, 1979, abandoned. This application Feb. 20, 1981, Ser. No. 236,430

The portion of the term of this patent subsequent to Dec. 18, 1996, has been disclaimed.

Int. Cl.³ C07C *27/22*

U.S. Cl. 568—909 **11 Claims**

1. In a process for the synthesis of an alcohol by the reaction of an olefinic hydrocarbon, carbon monoxide, and hydrogen in the presence of a catalyst selected from the group consisting of rhodium carbonyl compounds and rhodium-organometallic compounds, at reaction conditions, and recovering the resultant alcohol, the improvement which comprises utilizing an aqueous solution of ammonia as a promoter to produce alcohol as the major product of the process.

4,356,335
ARYL- OR ARALKYLBENZENE HAVING TWO BENZENE RINGS AT LEAST ONE OF WHICH IS SUBSTITUTED BY AT LEAST ONE 3,3,3-TRIFLUOROPROPYL GROUP

Yoshiro Kobayashi, Tokyo; Itsumaro Kumadaki, Hachiohji; Masaaki Takahashi, Tokyo, and Takashi Yamauchi, Iwaki, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Nihonbashi, Japan

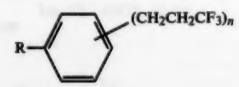
Filed Feb. 12, 1981, Ser. No. 233,715

Claims priority, application Japan, Feb. 22, 1980, 55-21090; Feb. 22, 1980, 55-21091; Feb. 22, 1980, 55-21092; Feb. 22, 1980, 55-21093; Feb. 22, 1980, 55-21094; Sep. 1, 1980, 55-120928; Nov. 21, 1980, 55-164434

Int. Cl.³ C07C *21/14*

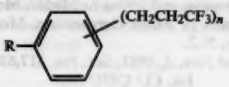
U.S. Cl. 570—129 **8 Claims**

1. A trifluoropropyl derivative of aryl- or aralkylbenzene of the general formula:



wherein R is a phenyl group, benzyl group, phenethyl group or alpha-methylbenzyl group, either unsubstituted or substituted by 3,3,3-trifluoropropyl group and n is 1, 2 or 3, provided that the total number of the 3,3,3-trifluoropropyl groups in said trifluoropropyl derivative of aryl- or aralkylbenzene is at most 3.

8. A dielectric material comprising at least one of the 3,3,3-trifluoropropyl derivatives of aryl- or aralkylbenzene of the formula:



wherein R is a phenyl group, benzyl group, phenethyl group or alpha-methylbenzyl group, either unsubstituted or substituted by a 3,3,3-trifluoropropyl group and n is an integer of 1, 2 or 3, provided that the total number of the 3,3,3-trifluoropropyl groups in said 3,3,3-trifluoropropyl derivative of aryl- or arakybenzene is at most 3.

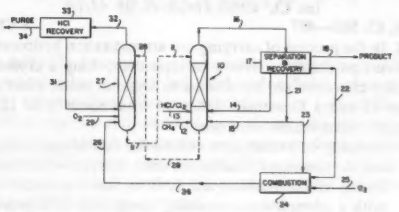
4,356,336
PURGING OF INERTS IN CHLORINATED HYDROCARBON PRODUCTION

Angel Sy, Cedar Park, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Filed Jun. 15, 1978, Ser. No. 915,895

Int. Cl.³ C07C *17/152*

U.S. Cl. 570—243 **7 Claims**



1. In a process for producing a chlorinated hydrocarbon from a C_1 to C_4 aliphatic hydrocarbon in a chlorinated hydrocarbon production zone wherein the effluent withdrawn from the chlorinated hydrocarbon production zone includes inert gas, the improvement comprising:

recovering an effluent from the chlorinated hydrocarbon production zone containing chlorinated hydrocarbon, inert gas, unreacted hydrocarbon and waste chlorinated byproduct;

recovering from the effluent a gas recycle stream containing unreacted hydrocarbon and the inert gas present in the effluent, a portion of which is recycled to the chlorinated hydrocarbon production zone;

recovering chlorinated hydrocarbon from the effluent;

recovering waste chlorinated byproducts from the effluent;

combusting waste chlorinated byproducts, said combustion employing the remaining portion of the gas recycle stream to recover hydrocarbon fuel values, said remaining portion of the gas recycle stream used in the combustion provides for purging of the net inert gas from the effluent subsequent to said combustion, said combustion producing a gaseous combustion effluent, said gaseous combustion effluent containing chlorine values and the inert gas;

separating from the combustion effluent chlorine values and a gas containing the inert gas; and

purging the gas containing the inert gas from the system.

4,356,337
PRODUCING CYCLOHEXENE OR ALKYLCYCLOHEXENE

Guido P. Pez, Boonton, and Irving L. Mador, Morristown, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Nov. 2, 1981, Ser. No. 317,626
Int. Cl.³ C07C 5/00
U.S. Cl. 585—267 10 Claims

1. A process for the selective hydrogenation of aromatic hydrocarbons which comprises reacting a liquid aromatic hydrocarbon selected from the group consisting of benzene and alkylbenzenes containing 7–10 carbons with an alkali metal selected from the group consisting of sodium, potassium and mixtures thereof, and with hydrogen in the presence of a polyamine containing only C, N and H, with at least 3 nitrogens, each nitrogen being linked to three carbons and each carbon bridge between nitrogens being at least two methylene units long, under conditions producing cyclohexene or alkylcyclohexene.

4,356,338
EXTENDING CATALYST LIFE BY TREATING WITH PHOSPHORUS AND/OR STEAM

Lewis B. Young, Skillman, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 61,223, Jul. 27, 1979, abandoned. This application Oct. 8, 1980, Ser. No. 195,032
Int. Cl.³ C10G 11/05, 49/08, 63/04
U.S. Cl. 585—407 8 Claims

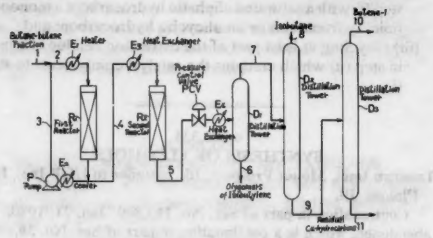
1. In the process of carrying out aromatization hydrocarbon conversion reactions over a catalyst comprising a crystalline zeolite characterized by a silica to alumina molar ratio of at least 12 and a Constraint Index of from about 1 to 12, the improvement which comprises:

pretreating said catalyst to reduce the rate of catalyst aging and detrimental formation of coke thereon which occurs during said conversion reactions, by reacting said catalyst with a phosphorus-containing compound to deposit between 2% and 15% by weight of phosphorus on said catalyst and by subjecting said catalyst to an atmosphere comprising from 5% to 100% of steam at a temperature of from about 250° C. to about 1000° C. for a period of from about 15 minutes to about 100 hours.

4,356,339
PROCESS FOR ISOLATING AND RECOVERING BUTENE-1 OF HIGH PURITY

Masao Imaizumi, Tokyo; Tetsuya Takezono, Kawasaki; Takaaki Amari, Yokohama, and Yutaka Oguchi, Tokyo, all of Japan, assignors to Nippon Oil Company, Limited, Tokyo, Japan

Filed Dec. 7, 1981, Ser. No. 328,317
Claims priority, application Japan, Dec. 15, 1980, 55-176882; Dec. 15, 1980, 55-176883; Dec. 15, 1980, 55-177008; Jul. 11, 1981, 56-108685
Int. Cl.³ C07C 7/12
U.S. Cl. 585—829 11 Claims



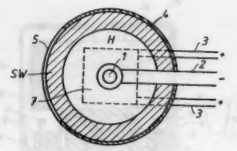
1. A process for isolating and recovering butene-1 of high purity at a high yield comprising the steps of continuously passing a butane-butene fraction containing 0.1 to 15 wt% of isobutylene and 10 to 50 wt% of butene-1 through a first reactor packed with a strongly acidic cation exchange resin having an average particle size of from 0.2 to 10 mm at a temperature of from 30° to 100° C. and at a space velocity of liquid of from 0.1 to 50 hr^{-1} under a pressure of from 1 to 50 atom., dividing the output mixture flowing out of said first reactor into two flows at a division ratio in flow rate of 1~15:1, recirculating the first flow having the flow rate of 1~15 into said first reactor packed with said cation exchage resin, passing the second flow having the flow rate of 1 through a second reactor packed with a strongly acidic cation exchange resin having an average particle size of from 0.2 to 10 mm at a temperature of from 30° to 100° C. and at a space velocity of liquid of from 0.1 to 50 hr^{-1} under a pressure of from 1 to 50 atm., distilling the output flow from said second reactor to separate the same into a heavy hydrocarbon fraction containing oligomers of isobutylene as the main ingredient and a light hydrocarbon fraction containing butane and butene as the main ingredients, and rectifying said light hydrocarbon fraction to isolate butene-1 from other C_4-hydrocarbons.

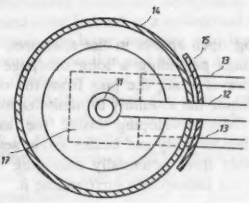
4,356,340

DC ARC FURNACE HAVING A SHIELDED ARC

Sven-Einar Stenkvist, Västeras, Sweden, assignor to ASEA Aktiebolag, Västeras, Sweden

Filed Mar. 11, 1980, Ser. No. 129,261
Claims priority, application Sweden, Mar. 12, 1979, 7902178; Oct. 9, 1979, 7908349
Int. Cl.³ H05B 7/00
U.S. Cl. 373—107 6 Claims





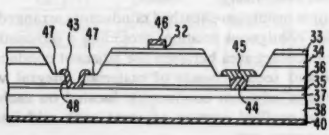
1. A DC arc furnace comprising a furnace vessel having a side wall and a hearth containing a melt, a melt connection through the hearth, an arcing electrode above the hearth, said melt connection being positioned vertically below said arcing electrode, DC powered conductors connecting to the melt connection and arcing electrode, the conductor connecting to the melt connection extending horizontally beneath the hearth from the melt connection away from the furnace transversely with respect to the side wall, the conductors powering an arc between the arcing electrode and melt and at least the conductor connecting to the melt connection forming a magnetic field capable of causing the arc to have an angularity with respect to the arcing electrode, and means for forming a magnetic metal shield surrounding only a portion of the side wall and on its side from which extends the conductor connecting with the melt connection so as to at least reduce said angularity.

4,356,341

CASCADE SOLAR CELL HAVING CONDUCTIVE INTERCONNECTS

Peter G. Borden, Menlo Park, and Ram R. Saxena, Saratoga, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Mar. 13, 1981, Ser. No. 243,676
Int. Cl.³ H01L 31/06
U.S. Cl. 136—249 8 Claims



1. A cascade solar cell having a wide bandgap cell epitaxially grown on a narrow bandgap cell and being electrically connected in series therewith, the improvement comprising:

said cells being electrically connected by means of a conductive interconnection formed between the base of the top cell and the emitter of the bottom cell through grooves formed in the top cell

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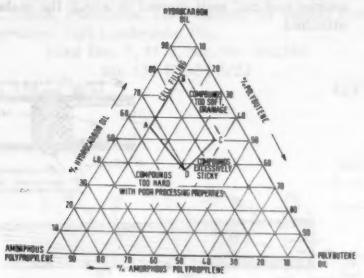
4,356,342

FULLY-FILLED TELECOMMUNICATION CABLES

Stefan Verne, London, England, assignor to BICC Limited, London, England

Continuation-in-part of Ser. No. 952,590, Oct. 18, 1978, abandoned, and Ser. No. 87,437, Oct. 22, 1979, abandoned. This application Aug. 13, 1980, Ser. No. 177,925
Claims priority, application United Kingdom, Aug. 29, 1979, 7929881; Aug. 29, 1979, 7941631
Int. Cl.³ H01B 3/18
U.S. Cl. 174—23 C 7 Claims



1. A fully-filled telecommunication cable comprising a multiplicity of conductors each insulated with cellular polymeric material selected from the group consisting of polyethylene and polypropylene and enclosed in a sheath, the interstices between the insulated conductors and between them and the sheath being filled with a waterproof filling medium having a base comprising a hydrocarbon oil, characterised by the use of two non-polar additives, namely:

(i) a first additive which is soluble and consists substantially of molecules that are substantially incapable of diffusing into polyethylene or polypropylene at temperatures of up to 80° C. but having a low enough (number average) molecular weight to reduce significantly the osmotic pressure of the base, this additive having no appreciable useful effect on the composition's resistance to flow at temperatures in the range 50°–80° C.; and

(ii) a second additive which is polymeric and has a high enough (viscosity average) molecular weight to raise the resistance to flow of the composition so that the cable will pass a water-penetration test as defined in Post Office Telecommunications Specification No. CW236 (issued by the Post Office Corporation in Great Britain) not only at room temperature but also at temperatures up to a limit that is higher than 50° C.

4,356,343

CLOSURE AND SEAL FOR SHEATHED MULTI-STRAND CABLE ENDS

Robert L. Larson, 2873 Velasco La., Costa Mesa, Calif. 92626

Filed May 12, 1980, Ser. No. 149,049
Int. Cl.³ H02G 15/04
U.S. Cl. 174—74 A 21 Claims

1. A seal assembly unit for the hermetic closure of a cut off end of a sheathed electrical cable having multiple conductors with interstices therebetween, including;

a form carrier with an exterior diameter approximately the

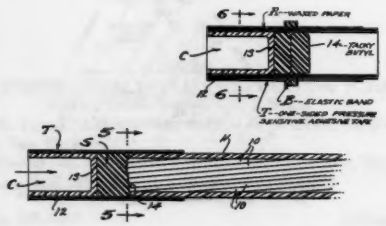
same as the exterior diameter of the cable sheath and having an end wall to oppose the cable end,

a sealant body of fluid material having a tacky consistency also with an exterior diameter approximately the same as the exterior diameter of the cable sheath and having opposite end faces,

one end face of the sealant body being adhesively attached to the end wall of the form carrier, and the other end face of the sealant body being exposed for opposed conforming engagement with the cut off end of the sheathed cable,

and a one-sided pressure sensitive adhesive tape laminated with a removable protective sheet having opposite release faces and wrapped around the assembled from carrier and sealant body for subsequent release and removal therefrom,

the protective sheet being removable from the adhesive tape which then can be rewrapped around and adhesively secured to the form carrier and sealant body and cable sheath, subsequent to forcefully applying the sealant body against said cut off cable end by manipulation of the form carrier and end wall thereof to which the sealant body is attached.



14. A sheathed electrical cable having multiple electrical conductors with interstices therebetween and having a cut off end, and a seal hermetically closing said cut off end, comprising, in combination;

a form carrier with an exterior diameter approximately the same as the exterior diameter of the cable sheath and having an end wall opposing the cable end,

a sealant body of fluid material having a tacky consistency also with an exterior diameter approximately the same as the exterior diameter of the cable sheath and having opposite end faces,

one end face of the sealant body being adhesively attached to the end wall of the form carrier, and the other end face of the sealant body being adhesively attached to and in conforming engagement with the cut off end of the sheathed cable with a portion of the sealant body extending into said interstices,

and a one-sided pressure sensitive adhesive tape wrapped around and adhesively secured to the form carrier and sealant body and cable sheath.

4,356,344

METAL-PLASTIC HEADER ASSEMBLY

James J. Carey, Henrietta, N.Y., assignor to Chloride Electro Networks, Division of Chloride, Inc., N. American Operation, Tampa, Fla.

Filed Jan. 26, 1981, Ser. No. 228,187
Int. Cl.³ H05K 5/06
U.S. Cl. 174—52 S **9 Claims**

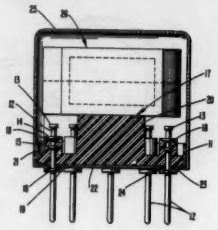
1. A hermetic enclosure assembly for a high voltage transformer comprising:

a metal header cover having interior and exterior portions and defining a plurality of apertures,

a header body comprising a rigid thermosetting plastic material form securely adhered to and filling a substantial part of the interior portion of the header cover,

a plurality of conductive pins protruding through said apertures, the header body further comprising first and second bushings surrounding and securely adhered to first and second portions of each of the pins respectively located at the interior and exterior portions of the header cover where the pins protrude,

the form and the first and second bushings of the header body being integral whereby the rigid thermosetting plastic material of which the header body is composed hermetically seals



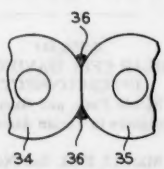
any remaining open spaces in the apertures, the first and second bushings providing a long creepage distance for moisture to travel along the pins from the outside of the assembly to inside the assembly to minimize moisture in the atmosphere from developing inside the assembly, and wherein the header body and header cover seal the interior of the assembly from potentially damaging materials and conditions in the atmosphere surrounding it.

4,356,345

MULTICONDUCTOR CABLE ASSEMBLY

Richard J. Gonia, New Berlin, Wis., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 31, 1980, Ser. No. 202,530
Int. Cl.³ H01B 7/08
U.S. Cl. 174—117 F **2 Claims**



1. A multiconductor cable assembly having a flat-profiled first portion comprising:

A. multiple insulation-sheathed conductors arranged in side-by-side contiguous relation, providing a substantial interfacing contact area between the adjacent conductors;

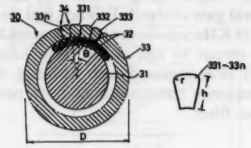
B. first and second beads of material, integral with the sheaths of adjacent conductors, located on each side of said flat-profiled portion adjacent each said interfacing contact area; and

C. an unbonded portion of said interfacial contact area between said first and second beads.

4,356,346
TRANSMISSION CONDUCTOR

Sadao Sakabe, Kyoto, Japan, assignor to Kansai Electric Power, Ltd., Osaka, Japan

Filed Nov. 12, 1980, Ser. No. 206,132
Claims priority, application Japan, Nov. 13, 1979, 54-147478; Sep. 17, 1980, 55-129605
Int. Cl.³ H01B 5/10
U.S. Cl. 174—130 4 Claims



1. A transmission conductor, comprising:
an inner conductor formed in a cylindrical shape; and
an outer conductor layer covering said inner conductor and being annular in section and having an even outer surface,
said outer conductor layer being split in at least one plane extending radially through the center of said transmission conductor into a plurality of split conductor elements, said plurality of split conductor elements being stranded in the longitudinal direction of said transmission conductor,
outer corners of the two adjacent split conductor elements at every predetermined number of junctions between said plurality of split conductor elements being formed in rounded corners to be arcuate in section with a radius r (m) of curvature,
said radius r (m) of curvature being selected to satisfy the following equation:

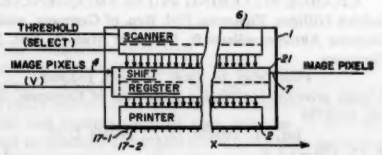
$$r = \frac{0.0508}{V}\left(10^{\frac{\theta-28.5}{113}} \sim 10^{\frac{\theta+5.2}{113}}\right)$$

where V (m/sec) is a wind velocity and θ (degree) is the angle from the groove to the groove, with respect to the center of the transmission conductor,
whereby at least one groove is formed on the outer surface of said outer conductor layer extending in the stranded longitudinal direction between said rounded corners of said adjacent split conductor elements.

4,356,347
INTEGRATED STYLUS ARRAY FOR PRINTER OPERATION

Patricia P. Wiener, La Honda, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 25, 1980, Ser. No. 181,330
Int. Cl.³ H04N 1/24
U.S. Cl. 178—30 20 Claims

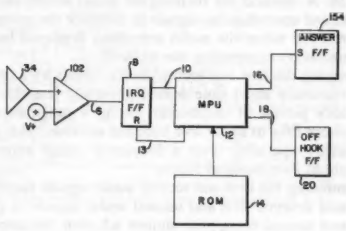


5. A solid state multi-mode printing array comprising in combination:
(a) multiple printing styli forming at least one printing array;
(b) multiple stage buffering means, the output of successive stages of said buffering means being coupled to successive ones of said printing styli;
(c) multiple scanning elements forming at least one scanning array for scanning images and producing image pixels representative of the images scanned;
successive ones of said scanning elements being coupled to the input of successive ones of said buffering means stages to provide parallel input of image pixels to said buffering means; and
(d) clock means for driving said buffering means to clock image pixels from said scanning array through said buffering means to said printing array.

4,356,348
TECHNIQUES FOR DETECTING A CONDITION OF RESPONSE ON A TELEPHONE LINE

Fred J. Smith, Plantation, Fla., assignor to Digital Products Corporation, Fort Lauderdale, Fla.

Filed Dec. 7, 1979, Ser. No. 101,149
Int. Cl.³ H04M 3/22
U.S. Cl. 179—1 MN 42 Claims

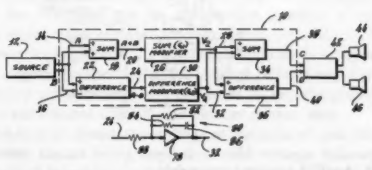


1. Apparatus for detecting a condition on a telephone line comprising:
means for monitoring a telephone line and ascertaining the presence of signals thereon;
means for determining a value representative of the period of each signal ascertained;
means for storing an indicia of each value determined for a group of signals whose presence was ascertained in a sequence; and
means for detecting the most common indicia of value stored for said group of signals whose presence was ascertained in said sequence.

4,356,349
ACOUSTIC IMAGE ENHANCING METHOD AND APPARATUS

Richard P. Robinson, Wallingford, Conn., assignor to Trod Nossel Recording Studios, Inc., Northford, Conn.

Filed Mar. 12, 1980, Ser. No. 129,752
Int. Cl.³ G11B 3/74; H04R 5/04
U.S. Cl. 179—1 G 21 Claims



7. An apparatus for modifying first and second audio signals

to enhance the acoustic imagery perceived when the modified audio signals are projected by audio transducers comprising

means for time delaying the first and second audio signals as a function of frequency in a predetermined manner, with the delay selected generally less than the refractory period of the human ear in the range from about fifty to about five hundred microseconds and with the delay operative over a frequency range below about five hundred Hertz;

means for generating a first composite signal formed of undelayed and delayed first audio signals and an out-of-phase delayed cross-feed of said second audio signal, the amplitude ratios of said delayed first audio signal, and of said delayed out-of-phase second audio signal cross-feed, relative to the undelayed first audio signal being each in the range from about 1.4 to about 4.3 as determined at a high frequency; and

means for generating a second composite signal formed of undelayed and delayed second audio signals and an out-of-phase delayed cross-feed of said first audio signal, the amplitude ratios, of said delayed second audio signal, and said delayed out-of-phase first audio signal cross-feed, relative to the undelayed second audio signal being each in the range from about 1.4 to about 4.3 as determined at a high frequency;

whereby said first and second composite signals when applied to said audio transducers significantly enlarge the spatial image perceived of the sound emanating therefrom.

10. A method for forming an audio stereo recording with first and second audio signals to enhance the acoustic imagery perceived when the audio recording is played back on audio transducers comprising the steps of:

delaying the first and second audio signals by a predetermined relatively short time period generally less than the refractory period of the human ear in a range extending from about fifty to about five hundred microseconds and with the delay operative over a frequency range extending below about five hundred Hertz;

combining the first and second audio signals respectively with said delayed first and second audio signals to generate first and second composite signals wherein the amplitude ratios of the delayed portions with respect to undelayed audio signals in each of said composite signals are in the range from about 1.4 to about 4.3 as determined at a high frequency; and

recording the first and second composite signals on a recording medium to form a stereo recording capable of producing, when played back through audio transducers, an enhanced spatial perception of the played back sound.

4,356,350

FM RECEIVER

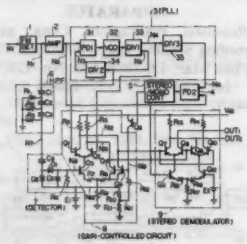
Masanori Ienaka, Kodaira, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 23, 1980, Ser. No. 162,087

Claims priority, application Japan, Sep. 21, 1979, 54-120648

Int. Cl.³ H04H *5/00*

U.S. Cl. 179—1 GJ **4 Claims**



1. An FM receiver comprising:

an FM detector;

a stereo demodulator which receives a main-channel signal and a sub-channel signal of a stereo composite signal obtained from an output terminal of said FM detector, as well as a 38 KHz sub-carrier signal;

a gain-controlled circuit which transmits said 38 KHz sub-carrier signal to said stereo demodulator;

a high-pass filter for obtaining high-frequency components in an output signal of said FM detector; and

a level detector for detecting the level of said high-frequency components that are obtained from said high-pass filter,

wherein the output signal of said level detector is transmitted to said gain-controlled circuit, and the amplitude level of said 38 KHz sub-carrier signal applied by said gain-controlled circuit to said stereo demodulator is gradually lowered in accordance with a rise in the level of said high-frequency components that are obtained from said high-pass filter.

4,356,351

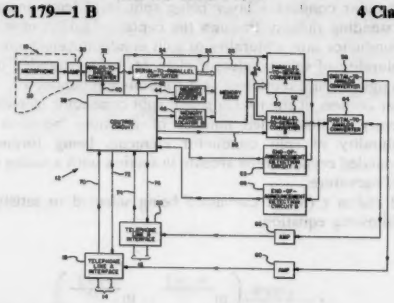
DIGITAL MEMORY AUDIO PLAYBACK APPARATUS

Gerald E. Shefler, and Ralph J. Weaver, III, both of Milwaukie, Oreg., assignors to Ford Industries, Inc., Portland, Oreg.

Filed Oct. 14, 1980, Ser. No. 196,688

Int. Cl.³ H04M *1/64*

U.S. Cl. 179—1 B **4 Claims**



1. Apparatus usable with a telephone answering device or the like for enabling the playing out of a common recorded announcement to a plurality of telephone lines which are operatively connected to the device, said apparatus comprising

a digital memory array constructed to receive and store an announcement in digital form,

for each telephone line, an associated pointer operatively connected to said array, each pointer being operable, on command, to track through the array, independent of each other pointer, and regardless of the current operating condition of any other pointer, to read out the announcement, and

means for each telephone line operatively connected to said array for enabling audio coupling to the line of an announcement read out by the associated pointer.

4,356,352

CIRCUIT ARRANGEMENT FOR TELEPHONE EXCHANGE SYSTEMS HAVING TIME STAGGERED CHARGE METERING PULSE FREQUENCIES

Friedrich Hilliges, Eichenau, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 28, 1980, Ser. No. 153,868

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1979, 2925794

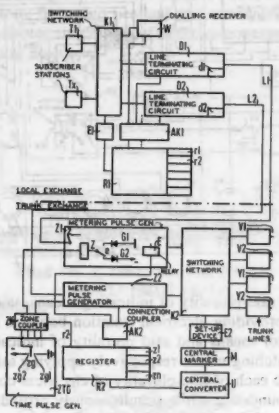
Int. Cl.³ H04M *15/12;* **H04Q** *3/70*

U.S. Cl. 179—7.1 R **3 Claims**

1. In a circuit arrangement for telecommunications exchanges in which trunk connections are established with the aid of a common control device via free connection lines which are combined in groups in response to a calling sub-

scriber dialing a local code number and a subscriber number of a called subscriber, and in which charge metering pulses are produced by charge metering equipment for the calling subscriber in reponse to answer by the called subscriber and at a frequency which is reduced in accordance with criteria including distance, time of day and calendar date, the improvement comprising:

first means responsive to a special, subscriber-dialed, code number preceeding the subscriber number to store a renunciation character; second means for selecting a free

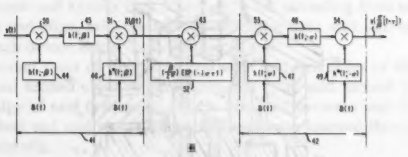


connection line from a group of connection lines which are simultaneously to be connected and responsive to stored renunciation characters to select free connection lines on a priority basis for those calling subscribers dialing a special code number only when charge metering reduction is in effect and to otherwise select lines on an equal priority basis; and third means responsive to a renunciation character and upon trunk line selection and completion of trunk line connection to provide a charge reduction signal to the charge metering equipment.

4,356,353
SAW-IMPLEMENTED TIME COMPANDOR

Kai Y. Eng, Parlin, and On-Ching Yue, Hazlet, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 21, 1980, Ser. No. 209,147
Int. Cl.³ H04B *1/66*
U.S. Cl. 179—15.55 T **10 Claims**



1. A time compandor including

companding means (40) capable of being responsive to a continuous-time input signal and also capable of delaying and either one of expanding the time duration of said input signal and compressing the time duration of said input signal to produce a companded output signal including a predetermined companding factor (α) and a predetermined time delay τ

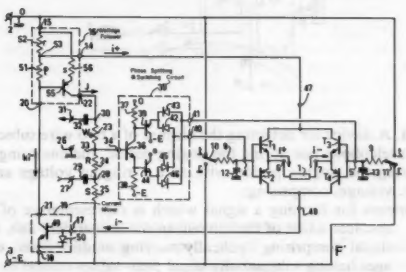
characterized in that

the companding means includes a cascaded arrangement of a first pi-network arrangement (41) comprising a separate linear dispersive filter in each branch of the pi, delay means (43,52) capable of multiplying the output signal from said first pi-network arrangement by a sinusoidal waveform whose frequency is proportional to the predetermined time delay (τ), and a second pi-network arrangement (42) comprising a separate linear dispersive filter in each branch of the pi.

4,356,354
ELECTRONIC SUBSCRIBER JUNCTOR

Gilbert M. M. Ferrieu, Bievres, France, assignor to Telecommunications Radioelectriques et Telephoniques T.R.T., Paris, France

Filed Jun. 16, 1980, Ser. No. 159,732
Claims priority, application France, Jun. 25, 1979, 79 16261
Int. Cl.³ H04M *1/76, 19/00*
U.S. Cl. 179—16 AA **13 Claims**



1. A subscriber junctor having a symmetrical power amplifier provided with two supply terminals for connection to a d.c. power supply, and two output terminals for connection to the two conductors of a subscriber's line, said junctor having a characteristic feeding bridge resistance (R_o) between the two terminals of the supply and being connectible to a telephone exchange, comprising:

means for forming a weighted sum current of the currents entering and leaving the subscriber's line,

a load impedance,

means for phase splitting and switching to form first and second voltages in phase and in phase opposition respectively with the voltage at the terminals of said load impedance through which the said weighted sum current flows and for applying said two voltages as negative feedback voltages to the two input terminals of the amplifier,

a current mirror for forming said weighted sum current, the summing terminal and input terminal of which are linked to a terminal of the d.c. power supply and to the corresponding supply terminal of said symmetrical power amplifier respectively,

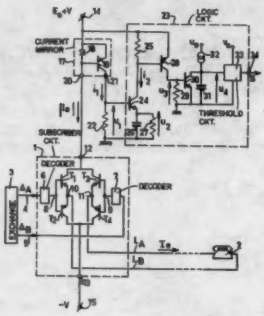
a voltage divider circuit, the output terminal of said current mirror being connected to one end of said voltage divider circuit, the other end and an intermediate terminal of said current miror being connected to the other terminal of said d.c. power supply and to the corresponding supply terminal of said amplifier respectively, the voltage ratio of said voltage divider circuit being adjusted so as to be substantially equal to the current ratio of said current mirror, and

a voltage follower circuit, the voltage at the ends of said voltage divider circuit being applied to said voltage follower circuit which is regulated so as to provide said weighted sum current having the desired amplitude.

4,356,355
APPARATUS FOR DETECTING THE CLOSURE OF A SUBSCRIBER'S LINE DURING RINGING

Gilbert M. M. Ferrieu, Bievres; Etienne J. R. Osmond, and Yves J. F. Hetet, both of Lannion, all of France, assignors to Telecommunications Radioelectriques et Telephoniques T.R.T., Paris, France

Filed Nov. 17, 1980, Ser. No. 207,118
Claims priority, application France, Nov. 21, 1979, 79 28722
Int. Cl.³ H04M *3/02*
U.S. Cl. 179—18 HB **4 Claims**



1. A device for detecting the closure of a two wire subscriber's telephone line during the ringing period, the line being fed during the ringing period with an a.c. ringing voltage and a d.c. voltage, comprising:

means for forming a signal which is representative of the absolute value of the current in the subscribers line, said signal comprising cyclically varying unidirectional voltages having substantially equal peak values caused by the a.c. voltage when the line is open and unequal peak values caused by the superimposed d.c. voltage when the line is closed,

a capacitor,

means for charging said capacitor when the voltage across the capacitor is less than the instantaneous value of said signal,

means for discharging said capacitor when the voltage across said capacitor is greater than the instantaneous value of said signal, and

means for producing a loop closure detection signal from a characteristic of the charging current for said capacitor, whereby the time constant of said discharging means is such that when the line is closed the voltage across said capacitor falls by less than the difference between the higher and lower peak values so that said capacitor is not charged when the lower peak value occurs.

4,356,356
HEADSET/GROUNDCORD TESTER APPARATUS

Martin E. Corbett, 5209 APO, New York, N.Y. 09179

Filed Sep. 18, 1980, Ser. No. 188,411
Int. Cl.³ H04M *3/22*; H04R *29/00*
U.S. Cl. 179—175.1 R **5 Claims**

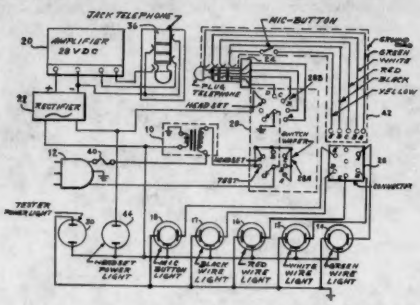
1. A headset/groundcord tester apparatus comprising in combination:

an energizing means to provide an electrical signal,

a plurality of indicating means each respectively connected to said energizing means,

first and second connector means to respectively attach to said groundcord, said first connector means containing a plurality of connector pins therein, said connector pins being wired respectively to said plurality of indicating means, each of said connector pins respectively mating with one of a plurality of electrical conductors in said groundcord, said second connector means receiving the other end of said groundcord and providing electrical connectors for each of said electrical conductors in said groundcord, and,

a switching means connected to said second connector means to provide a switchable signal return path for said electrical connectors, said switching means connected between said energizing means and said plurality of indicating means, said switching means switchably connecting

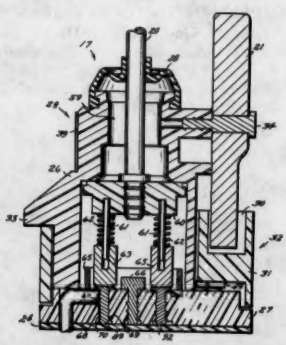


each of said plurality of indicating means, said switching means providing electrical isolation between said second connector means and said plurality of indicating means, said switching means respectively applying said electrical signal to each of said plurality of electrical conductors in said groundcord while simultaneously providing a signal return path, each of said indicating means respectively indicating the state of each of said plurality of electrical conductors.

4,356,357
SELECTOR AND DIRECTIONAL ACTUATOR FOR ELECTRICAL REMOTE CONTROL REARVIEW MIRRORS

Robert J. Fisher, Livonia, Mich., assignor to Harman International Industries, Inc., Grandville, Mich.

Filed Jul. 15, 1980, Ser. No. 169,189
Int. Cl.³ H01H *9/00, 19/00, 25/00*
U.S. Cl. 200—5 R **5 Claims**



1. A combination selector and direction control switch in a single elongate body for operating electrically powered left and right rearview remote control mirrors from a single actuator comprising:

a circuit plate in said body having a selectively operated inboard plurality of contacts for polarity reversal in four separate motors together with power leads and an integrated group of six contacts peripherally and concentrically out-

board of said polarity reversal contacts and enabling operational selection of mirrors as between said left and right mirrors;

a selector ring having bridging contactors selecting as between said left and right mirrors and in engagement with selected of said concentric outboard contacts;

a pendant element concentric within said selector ring and selectively contacting said inboard contacts and said power leads on said circuit plate to achieve selected reversal of polarity in two planes normal to each other; and

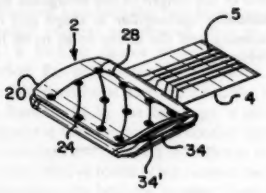
a lever separate from said pendant and concentrically operating said selector ring in one of said two concentric extremes of operating positions.

4,356,358

MEMBRANE SWITCH

Kazutoyo Fukukura, Reading, Mass., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 1, 1981, Ser. No. 279,289
Int. Cl.³ H01H *13/52*
U.S. Cl. 200—5 A 8 Claims



1. A membrane switch device of the type comprising a first membrane switch having a sheet of flexible insulating film with side edges and first and second end edges, conductors and switch electrodes on one surface of said sheet, a first fold line located substantially midway between said end edges and extending normally of said side edges, said sheet being folded along said fold line so that said end edges coincide and said sheet is divided into two parallel sections with the first surface on each section opposed to the first surface on the other section and with said switch electrodes opposed to each other, first separator means between said opposed first surfaces which maintains said surfaces in spaced-apart relationship, said separator means permitting relative movement of said electrodes towards and against each other, and a tail extending from said first end edge, said conductors extending onto said tail, said switch device being characterized in that:

a second sheet of film is integral with said first sheet of film, said second sheet of film extending from said second end edge of said first sheet, a slit is provided between said first sheet and said second sheet, said tail being inserted through said slit,

said second sheet of film having side edges and having an end edge which is remote from said first sheet, said second sheet being folded along a second sheet fold line which extends parallel to said first fold line to form a second membrane switch which is similar to said first membrane switch and which has opposed surfaces on which are provided second conductors and second opposed switch electrodes with a second separator means,

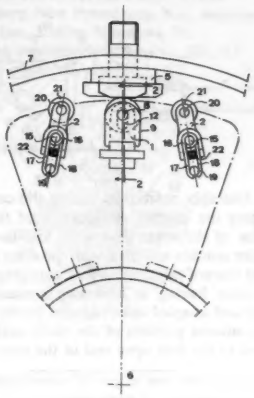
said second membrane switch being folded as a unit along said second edge of said first sheet whereby said first switch and said second switch are in parallel planes.

4,356,359

ELECTRICAL APPARATUS COMPRISING A SERIES OF CURRENT TAPS AND VARIABLE SWITCHING GEAR

Jean-Claude Dufrasne, Couillet, and Jules Thibaut, Mont-sur-Marchienne, both of Belgium, assignors to Ateliers de Constructions Electriques de Charleroi, Charleroi, Belgium

Filed Nov. 18, 1980, Ser. No. 207,880
Claims priority, application European Pat. Off., Nov. 21, 1979, 79200685.0
Int. Cl.³ H01F *29/04;* H01H *1/16, 1/56, 9/00*
U.S. Cl. 200—11 TC 6 Claims



1. An electrical contact apparatus comprising:

an insulating support upon which a row of stationary contacts is arranged, each stationary contact comprising at least one rolling surface;

a control slide mounted for parallel movement with respect to the row of stationary contacts;

an assembly of three moving contacts mounted on the control slide, comprising: a center strap telescopically mounted to said control slide, two end straps, each of said center and end straps being equipped with at least one associated roller capable of rolling on at least one surface of said stationary contacts, and means for mounting said end straps to said control slide such that the distance between said end straps varies laterally with respect to said center strap in response to said associated rollers of said end straps contacting a rolling surface of a stationary contact during movement of said control slide, and two impedances mounted on said control slide connecting said end straps, respectively, with said center strap.

4,356,360

PULL-TO-TURN SWITCH

Jack H. Volz, Maplewood, N.J., assignor to AMF Incorporated, White Plains, N.Y.

Filed Feb. 26, 1981, Ser. No. 238,304
Int. Cl.³ H01H *21/00*
U.S. Cl. 200—11 R 14 Claims

1. A pull-to-turn electrical switch including in combination:

a case having a first open end and a second wall end with an opening for access to the interior of the case;

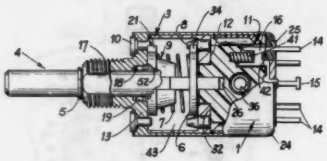
a first stop pin means projecting inwardly from the second wall end of said case;

a shaft mounted in said opening of the case for axial and rotational movement, having an interior end portion, and having an actuating end portion without the case;

stop collar means keyed to the shaft for rotation therewith and having a tab extention for abutting with said first stop pin means for defining the rotatable arc of the shaft;

a second plurality of stop pins disposed within the interior of the case;

stop washer means affixed to an intermediate portion of the shaft for axial and rotational movement therewith and having a tab projecting from a peripheral portion for abutting with one or more of said second plurality of stop pins for restricting rotation of the shaft while in a first axial position and not restricting rotation of the shaft while in a second axial position;



a rotor rotatably positioned within the case having means engaging the interior end portion of the shaft to effect rotation of the rotor therewith, and having at least one bridging contact movable with the rotor and positioned at an end thereof opposite to said engaging means; and

an end plate having at least two contact means secured thereto and adapted to be engaged by the bridging contact in a rotational position of the shaft, said end plate being secured to the first open end of the case.

4,356,361

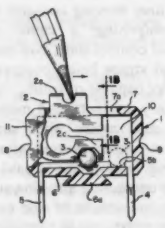
MODULAR ELECTRICAL SHUNTS AND SWITCHES FOR INTEGRATED CIRCUIT APPLICATIONS

Pierre P. Schwab, Ocean Springs, Miss., assignor to B/K Patent Development Company, Inc., Los Angeles, Calif.

Filed Oct. 21, 1980, Ser. No. 199,354

Int. Cl.³ H01H *15/00*

U.S. Cl. 200—16 D **9 Claims**



1. An electrical switch comprising:

an electrically insulating, substantially rectangular housing having a plurality of electrically non-conducting walls, including a base wall, a top wall having an aperture therein, and two end walls, said housing having additionally a pair of electrically non-conducting side walls bonded thereto;

a pair of elongated electrically conducting terminals secured to and extending through the base wall of the housing and protruding outwardly therefrom in substantially mutually parallel spaced relationship, each of said terminals having a portion located inwardly of the housing in a non-contacting, spaced relationship to the inwardly located portion of the other terminal;

an electrically conducting contact bearing disposed within the housing and adapted to be movable between a first position in which the contact bearing is in contact with but one of the terminal portions located within the bearing housing and a second position in which the bearing bridges the span between and is in simultaneous contact with both of the inwardly located terminal portions, said first and second positions corresponding respectively to "off" and "on" configuration of the electrical switch; and

a switch actuating member of electrically non-conducting material, said member being slidably disposed within the housing and engageable through the aperture in the top wall of the housing for actuating the switch, said member being adapted to resiliently bias the movable contact bearing in said first and second positions and permit the contact bearing to move in response to and in cooperation with the sliding movement of the member between the first and second positions.

9. A cartridge-dispenser for loading electrical switches according to claim 1 and installing and extracting said switches from integrated circuits, said cartridge-dispenser comprising:

a substantially flat elongated housing having a longitudinal recess extending the full length of said housing and adapted to slidably receive said switches therein;

an elongated cavity disposed within the housing on either side at each end of the longitudinal recess, each cavity containing a tension spring and a ball at the end of the cavity, said ball being dispensed to project resiliently into the longitudinal recess and coact with the end walls of the electrical switch; and

a cover fastened to the surface of the elongated housing and having an elongated aperture therein substantially narrower than the elongated recess in the housing and extending for at least a portion of the length of the elongated housing;

a button substantially rectangular in shape and disposed between the housing and the cover so as to be held slidably captive therebetween.

4,356,362

HAZARD SWITCH ARRANGEMENT

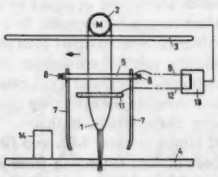
Karl H. Schmall, Waldstrasse 20, D-7570 Baden-Baden 19, Fed. Rep. of Germany

Filed Nov. 21, 1980, Ser. No. 208,937

Claims priority, application Switzerland, Dec. 20, 1979, 11306/79

Int. Cl.³ H01H *3/16*

U.S. Cl. 200—47 **6 Claims**



1. In a hazard arrangement for flame-cutting and welding units in which a torch is moved in at least one axis by a servomotor as a function of control signals which can be preset, and wherein the arrangement includes a feeler provided in the region of the torch nozzle, said feeler being connected to an emergency switch device and and emitting a warning signal to prevent damage to the torch, when obstacles occur in the direction of motion of the torch nozzle, characterized in that said feeler comprises a plurality of feeler rods which screen the torch at least in the direction of the motion, and that said feeler rods are connected to a plurality of movement switches for activating said emergency switch device.

4,356,363

LOCKING DEVICE FOR CONTACT CARRIERS

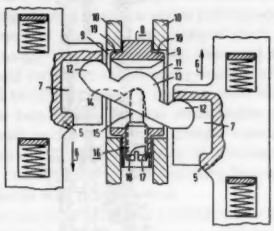
Werner Harbauer, Schwandorf, and Edgar Wiessner, Amberg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 5, 1980, Ser. No. 184,427

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1979, 2937710

Int. Cl.³ H01H 9/20

U.S. Cl. 200—50 C 10 Claims



1. An interlocked contact assembly comprising two contact carriers each movable between first and second positions, housings in which respective contact carriers are disposed, a mounting structure to which the two housings are secured so that the contact carriers are spaced apart in a side-by-side relationship, a locking device disposed between the two contact carriers for preventing both contact carriers from being in the first position at any one time, the locking device including a frame held by the housings, a latching member pivotally supported between the two contact carriers engaging both contact carriers and pivoting in response to movement of a contact carrier relative to the other contact carrier, means for pivotally supporting the latching member from the frame, and means for adjusting the latching member relative to the contact carriers.

4,356,364

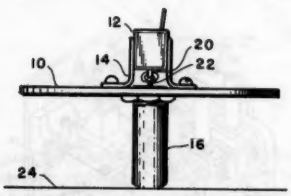
SHOCK-SENSITIVE ELECTRICAL SWITCH

John Soto, 1133 Rex Rd., Hayward, Calif. 94541

Filed Apr. 20, 1981, Ser. No. 255,701

Int. Cl.³ H01H 35/14

U.S. Cl. 200—61.52 7 Claims



1. An electrical switching assembly for switching from a first switch position to a second switch position when subjected to a predetermined level of shock and vibration, said switching assembly comprising:

a horizontal plate;

an electrical switch mounted to the top surface of said plate, said switch having an inward and outward actuating trigger extending downward through an opening in said plate at the center of gravity of said plate;

a vertical tube, the top end of said tube being connected to said plate through said opening at the center of gravity of said plate whereby the longitudinal axis of said tube is substantially aligned with said center of gravity; and

an actuating rod connected to said switch actuating trigger, said rod extending through said tube and outward from the end thereof when said switch is in a second switch position, and the end of said rod being flush with the bottom end of said tube when said switch is in its first switch position.

4,356,365

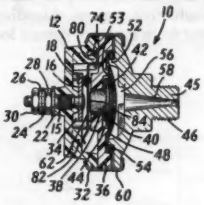
AIR OPERATED DC SWITCH

Hemming G. Siiberg, New Providence, N.J., assignor to Edison International, Inc., Rolling Meadows, Ill.

Filed Oct. 24, 1980, Ser. No. 200,451

Int. Cl.³ H01H 35/34

U.S. Cl. 200—83 J 15 Claims



1. In a switching device having at least one fixed contact, an armature, and an actuating means for moving said armature, the improvement wherein:

(a) said armature comprises floating blade having a first end including a main portion with at least two fingers extending therefrom, said main portion defining mechanical contact means;

(b) at least one of said fingers having a contact at the distal end portion thereof;

(c) means for supporting said armature so that said contact at the distal end portion of said one finger is in registration with and spaced from said fixed contact;

(d) said armature support means including:

(i) means fixedly positioning the distal end portion of the other of said two fingers of said floating blade of said armature; and

(ii) surface means supportively engaging said mechanical contact means of said main portion of said armature, said mechanical contact means being slidable along said surface means in response to the application to force to said armature by said actuating means; and

(e) said actuating means being positioned adjacent to an intermediate portion of said other of said at least two fingers for applying a force to said intermediate portion, said armature flexing in response to the application of said force for engaging said contacts in a wiping motion.

4,356,366

CIRCUITRY COMPONENT

William P. Harper, Phoenix, and Michael J. Taylor, Mesa, both of Ariz., assignors to Rogers Corporation, Rogers, Conn.

Filed Jun. 5, 1980, Ser. No. 156,759

Int. Cl.³ H01N 3/12; H01B 1/06

U.S. Cl. 200—159 B 10 Claims

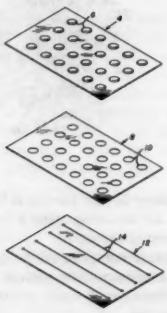
1. An improved switch array for use in a keyboard assembly comprising:

means defining first contacts of the switches of the array, said first contact defining means including a planar non-conductive substrate having a plurality of conductors disposed on a first surface thereof; and

means defined second contacts of the switches of the array, said second contact defining means including:

a flexible non-conductive substrate, said flexible substrate defining a second plane parallel to the plane of the substrate of said first contact defining means, said flexible substrate having a plurality of protusions therein, said protusions extending away from said first contact defining means and being configured to snap through said second plane towards said first contact defining means upon application of force thereto, said protusions being in registration with conductors on the substrate of said first contact defining means;

a plurality of spacially separated conductive regions on a first surface of said flexible substrate, said first surface facing said first surface of said first contact defining means, said conductive regions being spacially separated from said plurality of conductors, said conductive regions have been formed by the selective chemical removal of adhered conductive material from said first surface of said flexible substrate, each of said protusions having conductive regions extending partly onto the wall thereof from a pair of spaced locations; and



a conductive ink on the wall of said protusions and at least partly overlaping adhesive from which conductive material has been chemically removed, said conductive ink bridging the space between the conductive regions which extend part way into the protusions to establish a current path therebetween, said conductive ink also functioning as a moveable switch contact and contacting a conductor on said first contact defining means when the associated protusion is caused to snap through said second plane, said conductive ink including conductive particles in a thermosetting binder, said thermosetting binder being selected from the group of binders having hydroxyl functionality and the ability to form hydroxyl groups, said conductive ink further including a multi-functional isocyanate having a molecular weight in the range of 150 to 350 and a low vapor pressure relative to other low molecular weight isocyanates at standard temperature and pressure, said isocyanate comprising about three percent to about ten percent by weight of the binder.

4,356,367

ELECTRIC SWITCH

David W. Moldenhauer, LaGrange, N.C., assignor to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Jun. 8, 1979, Ser. No. 46,975
Int. Cl.³ H01H *9/02*
U.S. Cl. 200—298 **43 Claims**

1. An electric switch apparatus comprising:

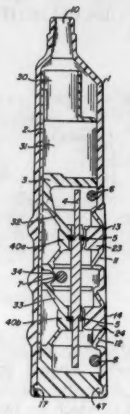
an inner member composed of a resilient electrically non-conducting material;

a plurality of electrical contacts at least partially disposed within said inner member;

conducting means at least partially disposed within said inner member for selectively forming a conductive electrical path between preselected pairs of said contacts;

said inner member having at least one integral resiliently deformable diaphragm means for at least partially supporting said conducting means;

an outer resilient housing member at least partially surrounding said inner member;



said outer member having cable entrance means for providing for access by a plurality of electrical conductors to said contacts; and

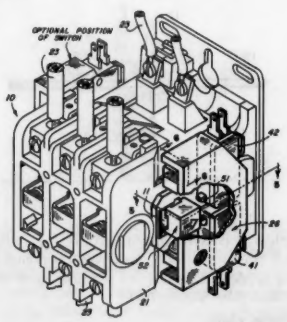
said outer member having at least one integral resilient deformable diaphragm means adapted to be operably engaging said conducting means for at least partially supporting said conducting means and transmitting forces applied to the exterior of said housing member to said conducting means to form an electrical path between preselected pairs of said contacts.

4,356,368

AUXILIARY SWITCH ASSEMBLY FOR A POWER CONTACTOR

Thomas F. Osika, Valparaiso, Ind., assignor to McGill Manufacturing Company, Inc., Valparaiso, Ind.

Filed May 1, 1980, Ser. No. 145,804
Int. Cl.³ H01H *45/02, 45/08*
U.S. Cl. 200—307 **5 Claims**



1. An auxiliary electrical switch assembly adapted to be mounted on and to be operated by a power contactor, which contactor has a side wall and an actuator movable in a cavity in such wall, said assembly including

an insulating housing having a cover portion and separated

wall portions at right angles to said cover portion to engage said contactor side wall and space said cover portion therefrom to accommodate auxiliary electrical switch assembly elements within said space,

said housing cover portion having a plurality of integral projecting portions and a plurality of integral studs on the inside thereof, with each said projecting portions having a bore extending therethrough to receive a mounting screw therein for securing said assembly to said contactor side wall and each having projecting means thereon to position said housing relative to said acutator prior to securing said assembly on said wall, with said integral studs adapted to extend through the housing on an electrical switch and position said switch in said housing and assembly,

an electrical switch including a housing with bores therein adapted to receive said integral studs within said switch housing, said switch including a plunger extending out of said switch housing and a plurality of terminals, with said terminals extending out of said insulating housing between said separated wall portions, and

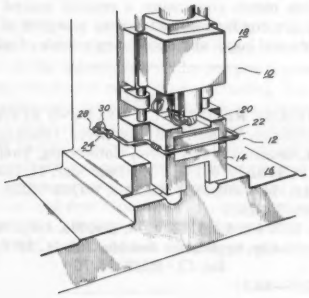
said auxiliary assembly including a connector to be mechanically connected to said actuator at a position within the space in such insulating housing and positioned therein to engage said switch plunger upon movement of said actuator and said connector.

4,356,369

GUARD APPARATUS

Thomas E. Hostetler, New Carlisle, and Ted J. Ellis, Jr., Goshen, both of Ind., assignors to Bristol Corporation, Elkhart, Ind.

Filed Feb. 12, 1981, Ser. No. 233,926
Int. Cl.³ H01H *9/20, 3/20*
U.S. Cl. 200—334 **12 Claims**



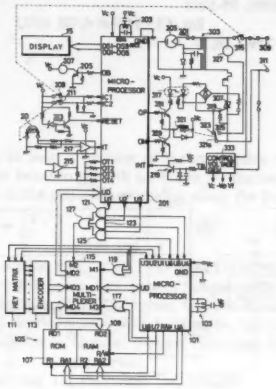
1. A guard apparatus for production machines having an emergency stop circuit and hazardous work areas in which injury to workers can occur, comprising a guard rod disposed generally horizontally around the perimeter of the hazardous work area of the machine, including a guard section and an angularly moveable end section, pivot means supporting said angularly moveable end section, an activation mechanism connected to said end section of said rod, a switch disposed in said mechanism and operated by pivotal movement of said one rod end section in angular opposite directions, a resilient means urging said rod to a central position, an electric circuit connecting said switch to the emergency stop circuit of the machine, and means for connecting said rod to said switch so that upward or downward deflection of said rod sections from said central position trips said switch for interrupting the operation of the machine through said electric circuit and the emergency stop circuit.

4,356,370

APPARATUS FOR CONTROLLING ELECTRONIC CONTROLLED COOKING APPARATUS

Atsushi Horinouchi, Otsu, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Mar. 13, 1980, Ser. No. 130,152
Claims priority, application Japan, Mar. 19, 1979, 54-33094
Int. Cl.³ H05B *6/68*
U.S. Cl. 219—10.55 B **18 Claims**



1. An apparatus for controlling an electronic controlled cooking apparatus, comprising:

energy generating means for generating energy for cooking a material being cooked,

entry means for providing data concerning cooking conditions being applied to said material being cooked,

storage means for storing data concerning a fixed cooking condition corresponding to a specified one of the pieces of said cooking condition data being provided by said entry means,

data display means for displaying at least said cooking condition data entered by said entry means, and

control means responsive to at least one of said cooking condition data entered by said entry means and said fixed cooking condition data obtained from said storage means for controlling said energy generating means,

said control means comprising at least two independently operable microprocessor means which cooperate with each other, data transmission means for providing a data transmission path between said two microprocessor means, at least one of said microprocessor means being adapted to detect said cooking condition data entered by said entry means, at least the other of said microprocessor means being responsive to the data received from said one microprocessor means to control said energy generating means and one of said two microprocessor means also for controlling said data display means to display the data received by said one microprocessor means,

each of said at least two microprocessor means further comprising means for cyclically providing a separate individual synchronizing signal,

coincidence detecting means for detecting coincidence of said synchronizing signals of said at least two microprocessor means, and

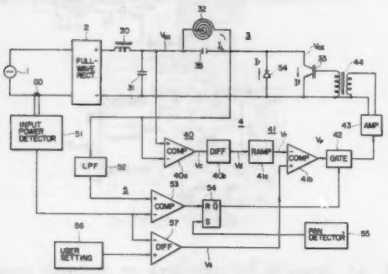
said data transmission means being responsive to the output of said coincidence detecting means for directly transmitting data from said one microprocessor means to said other microprocessor means to be received thereby for controlling said energy generating means in accordance with the data entered into and transmitted from said one microprocessor means.

4,356,371

SMALL LOAD DETECTION BY COMPARISON BETWEEN INPUT AND OUTPUT PARAMETERS OF AN INDUCTION HEAT COOKING APPARATUS

Mitsuyuki Kiuchi, Minoo; Takumi Mizukawa, Neyagawa; Hideyuki Kominami, Takatsuki, and Kenji Hattori, Amagasaki, all of Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan

Filed Nov. 10, 1980, Ser. No. 205,861
Claims priority, application Japan, Nov. 12, 1979, 54-146893; Jan. 9, 1980, 55-1091
Int. Cl.³ H05B 6/08, 6/12
U.S. Cl. 219—10.77 11 Claims



1. An induction heat cooking apparatus comprising:

a semiconductor power-rated switching device,

a resonant circuit formed by an induction heating coil and a capacitor means for converting a low frequency input into a high frequency output in response to the conduction of said semiconductor power-rated switching device and for heating an inductive load placed in overlying relation with said heating coil,

an input detector means for sensing said low frequency input,

an output detector means for sensing said high frequency output,

reference means for generating a reference voltage corresponding to a user's power setting level,

a feedback circuit including:

a reference crosspoint detector means for sensing when said high frequency output reaches a predetermined voltage level, and

a pulse-width modulated pulse generator means responsive to the output of said reference crosspoint detector means for generating a gating pulse having a duration which is a function of said reference voltage for gating said switching device into conduction thereby controlling the power level of said high frequency output to tend toward said power setting level and to attain a high value in comparison with said low frequency input when said inductive load is lower than a predetermined value, and

a comparator means for comparing the outputs of said input and output detector means to generate a comparator output when the sensed high frequency output is greater in magnitude than the sensed low frequency input, and

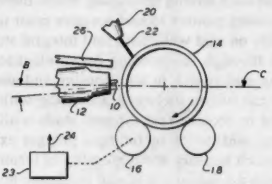
means for inhibiting said apparatus in response to said comparator output.

4,356,372

SHEILED-ARC TUBE WELDER WITH INTERMEDIATE GAS SUPPLY

Howard P. Inscho, Steuben, and Lucas H. Van Rhyn, Livingston, both of N.Y., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Dec. 3, 1979, Ser. No. 99,798
Int. Cl.³ B23K 9/16
U.S. Cl. 219—60 R 14 Claims



1. Welding apparatus for forming a joint between two sections comprising:

weld means for welding together portions of said two sections adjacent said weld means, said weld means including an electrode adjacent said joint;

a shielding hood encircling said weld means, said shielding hood encircling said electrode;

feed means spaced a given distance from said weld means for feeding filler wire into a melted portion of said joint;

translation means for producing relative motion between said joint and said weld means; and

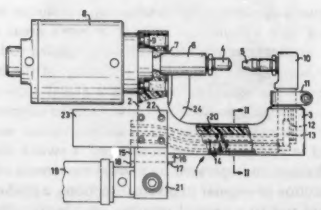
intermediate means for applying a stream of gas to said joint at a location said feed means and said weld means, said stream of gas being directed to restrict flow of said gas toward said weld means and to urge said melted portion of said joint in a direction to allow joining of said two sections, said stream of gas being composed differently than the gaseous ambient within said shielding hood, said intermediate means comprising: a conduit spaced from said hood for conducting said gas to a region of said joint outside said hood, said hood being outside of said conduit.

4,356,373

ELECTRICAL RESISTANCE WELDING APPARATUS

Karl E. Mattson, Näsum, and Hass Bertil, Olofstrom, both of Sweden, assignors to AB Volvo, Gothenburg, Sweden

PCT No. PCT/SE79/00159, § 371 Date Mar. 21, 1980, § 102(e) Date Mar. 14, 1980, PCT Pub. No. WO80/00229, PCT Pub. Date Feb. 21, 1980
PCT Filed Jul. 19, 1979, Ser. No. 190,870
Claims priority, application Sweden, Jul. 21, 1978, 7808042
Int. Cl.³ B23K 11/10
U.S. Cl. 219—86.31 3 Claims



1. In electrical resistance welding apparatus comprising an electrode holder arm (1,2,3) which at its free end (3) carries a liquid-cooled electrode (5) and at a distance from the same has connections (15) for current supply and coolant, said arm being made as a hollow shell construction and current as well as

coolant supply to the electrode (5) being effected through the arm (1); the improvement in which in the interior of the arm (1), two tubes (14) of a material with good electrical conductivity extend from the current and coolant connections (15) to a holder means (10) for the electrode (5), said tubes (14) conducting current to, as well as coolant to and from, the electrode (5), and a rigid sound-damping material means in the interior cavity of the arm (1) between its walls and the tubes (14).

4,356,374

ELECTRONICS CIRCUIT DEVICE AND METHOD OF MAKING THE SAME

Masaharu Noyori, and Hiroaki Fujimoto, both of Neyagawa, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Division of Ser. No. 882,152, Feb. 28, 1979, Pat. No. 4,246,595. This application Jul. 10, 1980, Ser. No. 168,418

Claims priority, application Japan, Mar. 8, 1977, 52-25603; Apr. 7, 1977, 52-40022; May 13, 1977, 52-55624; Sep. 21, 1977, 52-114296; Sep. 28, 1977, 52-117068

Int. Cl.³ B23K *9/00*

U.S. Cl. 219—121 PE **7 Claims**

1. A method of making an electronic circuit device comprising the steps of:

forming an etching mask of a specified pattern on a first resin film of a composite resin film comprising said first resin film and a second resin film, said first resin film and said second resin film being subject to etching by different etchants respectively,

selectively etching said first resin film with a first etchant by utilizing said etching mask thereby forming recesses or holes,

bonding at least one semiconductor device on said second resin film at the part where said recesses or holes are formed on the opposite side of the composite resin film by utilizing said second resin film as a bonding film,

etching said second resin film exposed from said recesses or holes by means of a plasma etchant which is different from the first etchant, thereby forming through-holes with a sloped wall with a round peripheral part, and

forming a wiring conductor of a metal film of a specified pattern on said first resin film and continuously into said through-holes, thereby electrically connecting specified parts of said semiconductor device and said wiring conductor.

4,356,375

PROCESS FOR PRODUCING LINES OF WEAKNESS IN THE PROTECTIVE BACKING OF AN ADHESIVE LAMINATE

Karl Josephy, Los Angeles, and Richard R. Baggarley, Arcadia, both of Calif., assignors to Avery International Corporation, San Marino, Calif.

Filed Jul. 10, 1980, Ser. No. 168,192

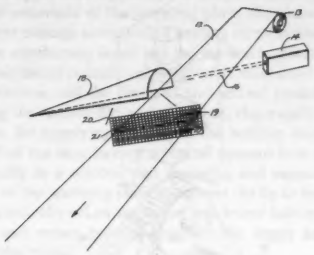
Int. Cl.³ B23K *27/00*

U.S. Cl. 219—121 LH **35 Claims**

1. A process for forming a line of weakness in the protective backing of an adhesive laminate, the process comprising the steps of:

(a) generating a laser beam of sufficient energy density to vaporize at least a portion of the protective backing of an adhesive laminate;

(b) focusing the laser beam in a focal line extending across the protective backing for a time sufficient for vaporizing at least a portion of the protective backing; and



(c) vaporizing at least a portion of the protective backing with the laser beam to a depth sufficient for forming a line of weakness in the protective backing along the focal line.

4,356,376

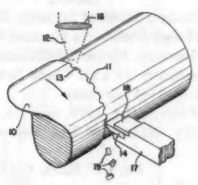
PULSE LASER PRETREATED MACHINING

Ranga Komanduri; Minyoung Lee, both of Schenectady; Donald G. Flom, Scotia; Robert A. Thompson, Quaker Street; Marshall G. Jones, Scotia, and Robert J. Douglas, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 13, 1981, Ser. No. 263,235

Int. Cl.³ B23K *27/00*

U.S. Cl. 219—121 LN **9 Claims**



1. A method of machining a workpiece made of a difficult-to-machine material comprising:

pretreating the outer surface of the workpiece prior to the cutting process by using a pulse laser beam to drill circumferentially spaced holes in a layer of material to be removed, said holes having a depth no greater than a known depth of cut of a cutting tool; and

rotating said workpiece relative to said cutting tool to remove the layer of material which is weakened by said holes and to generate a segmented chip.

4,356,377

CUTTING THIN METAL SHEET WITH AN ELECTRON BEAM

James F. Norton, Alplaus; Gerald B. Kliman, Schenectady, and Russell E. Tompkins, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 19, 1981, Ser. No. 235,811

Int. Cl.³ B23K *15/00*

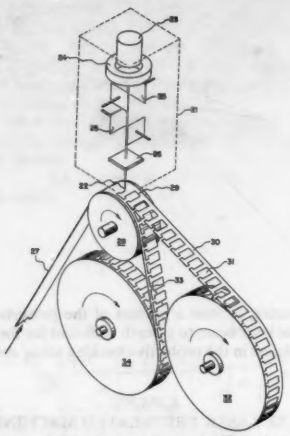
U.S. Cl. 219—121 EH **10 Claims**

1. The method of rapidly cutting thin metal sheet material which comprises:

moving a focused electron beam and said metal sheet relative to one another to heat locai regions of the entire thickness of the material above its melting temperature and produce molten metal and cut through said sheet along designated lines;

said metal sheet moving along a curved path beneath said

electron beam and having sufficient centrifugal force to propel molten metal away from the surface of said sheet so



that the edges of the cut solidify with no appreciable formation of beads along the cut edges and with negligible increase in the thickness of said metal sheet.

4,356,378

APPARATUS FOR AUTOMATICALLY GUIDING A WELDING GUN ALONG A PROGRAMMED WELDING SEAM

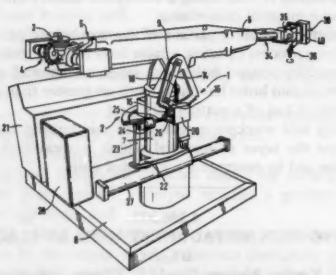
Erwin Cloos, Haiger; Manfred Schmidt, Haiger-Allendorf; Helmut Kring, Haiger-Steinbach; Gerhard Schnell, Beilstein, and Joachim Thielmann, Haiger-Rodenbach, all of Fed. Rep. of Germany, assignors to Carl Cloos Schweisstechnik GmbH, Haiger, Fed. Rep. of Germany

Filed Sep. 4, 1979, Ser. No. 72,530

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1978, 2851063

Int. Cl.[3] B23K *9/12*

U.S. Cl. 219—124.1 **11 Claims**



1. A welding robot, comprising:

a base;

an arm mounted on said base for pivotal movement about mutually perpendicular axes;

adjustment means for effecting a variance of the length of said arm at one end thereof;

a first decoder means for measuring the angle of traverse of said arm about one of said mutually perpendicular axes;

mounting means on said one end of said arm;

commuter means mounted on said mounting means, said commuter means including welding gun means and support means supporting said welding gun means for movement in two mutually perpendicular planes separate from planes defined by the movement of said arm about said mutually perpendicular axes, said commuter means including a housing, a drive motor mounted on said housing, a first axle rotatably supported on said housing and driven by said drive motor, a guide bar secured to said first axle for movement therewith, a slide block slidably secured to said guide bar and having means thereon defining a second block axle extending parallel to said first axle, said support means including a cross-slide member having first and second carriages, said first carriage being fixedly mounted on said second axle, said second carriage being mounted for relative movement between said first carriage and said housing, said welding gun means further including a welding gun secured to and movable with said first carriage; and

a second decoder means for measuring the angle of traverse of said first axle relative to said housing.

4,356,379

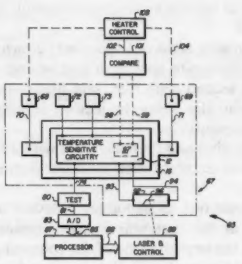
INTEGRATED HEATING ELEMENT AND METHOD FOR THERMAL TESTING AND COMPENSATION OF INTEGRATED CIRCUITS

Jerald G. Graeme, Tucson, Ariz., assignor to Burr-Brown Research Corporation, Tucson, Ariz.

Continuation of Ser. No. 869,228, Jan. 13, 1978, abandoned. This application May 27, 1980, Ser. No. 153,764

Int. Cl.[3] H05B *1/00*; B01J *17/00*

U.S. Cl. 219—209 **7 Claims**



1. A monolithic integrated circuit chip including temperature sensitive circuitry located in a relatively small portion of said integrated circuit, said integrated circuit comprising in combination:

(a) a heating resistor substantially surrounding said temperature sensitive circuitry for heating said temperature sensitive circuitry in response to an electrical signal being applied to the heating resistor, said heating resistor being sufficiently close to said temperature sensitive circuitry to cause said heating resistor to heat said temperature sensitive circuitry to a predetermined temperature substantially more rapidly than thermal equilibrium is attained in remaining portions of the integrated circuit chip;

(b) first bonding means connected to one electrode of said heating resistor for conducting said electrical signal to said heating resistor;

(c) a trimmable element determinative of the thermal drift of a temperature sensitive electrical parameter of said temperature sensitive circuitry, whereby said trimmable element may be trimmed to compensate the thermal drift in response to a measurement of the temperature sensitive parameter when said heating resistor is utilized to heat the temperature sensitive circuitry; and

(d) means in said temperature sensitive circuitry for effecting measuring of said temperature sensitive parameter after said temperature sensitive circuitry has risen to said predetermined temperature and substantially before thermal

equilibrium is established in said remaining portions of the integrated circuit;

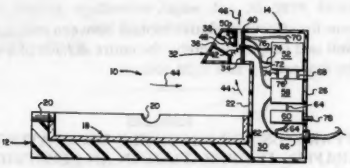
whereby said resistive heating means can be energized to rapidly heat said temperature sensitive circuitry to said first temperature and immediately measure said temperature sensitive parameter while said integrated circuit is in a wafer without the necessity of waiting for portions of the wafer more remote from said resistive heating means than said temperature sensitive circuitry to be heated to said predetermined temperature.

4,356,380

ELECTRIC CIGARETTE LIGHTER

Charles T. Kao, 465 Stillmeadow, Richardson, Tex. 75081

Filed Dec. 12, 1980, Ser. No. 215,617
Int. Cl.³ F23Q *7/20*
U.S. Cl. 219—262 **4 Claims**



1. An electric cigarette lighter comprising, in combination:

a housing of electrically insulating material having a lower base portion defining an ashtray and an upper housing portion supported in a position overlying the ashtray, said upper housing portion having an upwardly extending passage defining a chimney overlying the ashtray, and having a transversely extending cigarette guide passage communicating with the chimney passage;

an electrical resistance heating element disposed within the chimney passage in alignment with the cigarette guide passage;

an electrical circuit connected to said heating element for conducting electrical current to said heating element from an external power source; and,

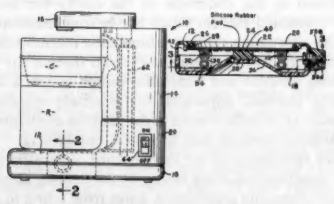
switching means coupled to said circuit for opening and closing a conductive path from the external power source to said heating element.

4,356,381

WARMING PLATE MOUNTING ARRANGEMENT IN A SINGLE-PASS DRIP-TYPE ELECTRIC COFFEEMAKER

John J. Flaherty, Jr., West Hartford, and Gus W. Wallin, Waterbury, both of Conn., assignors to Scovill Inc., Waterbury, Conn.

Filed Oct. 1, 1980, Ser. No. 192,904
Int. Cl.³ A47J *31/00;* H05B *1/02;* F24H *1/12*
U.S. Cl. 219—283 **3 Claims**



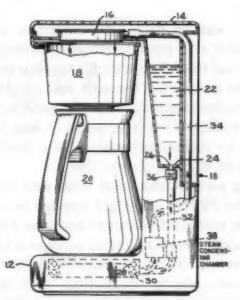
1. An electric single-pass drip-type coffeemaker comprising a plastic base having upper and lower halves, the upper half having an upper surface formed with opening adjacent the front thereof, the opening surrounded by a downward lip, a reservoir extending up at the rear of the base of a product spout at the top of the reservoir, a metal warming plate laterally immobilized in the opening by a plurality of downward projections on the upper half, a generally U-shaped extrusion secured against the underside of the warming plate, the extrusion having an upper passage containing a heating element and a lower passage for conducting liquid and having first and second ends, first conduit means containing check valve means and connecting the reservoir and the first end and second conduit means connecting the second end and the spout, electrically conductive means for supplying current to the heating element, the lower half of the base having a central upward boss terminating upwardly in a silicone pad engaging and supporting the underside of the warming plate up against the lip to immobilize the plate vertically when the upper and lower halves are held together, and means holding together the upper and lower halves of the base.

4,356,382

DRIP COFFEEMAKER HAVING A CONDENSER ELIMINATING DELIVERY OF STEAM TO THE WATER SPREADER

Bahram Keramati, Scotia, N.Y.; Steven C. Bray, Chillicothe, Ill., and Ralph T. Wood, Clifton Park, N.Y., assignors to General Electric Company, New York, N.Y.

Filed Aug. 28, 1980, Ser. No. 181,955
Int. Cl.³ A47J *31/051, 31/54;* F24H *1/12;* F04B *19/24*
U.S. Cl. 219—297 **4 Claims**



1. In a drip coffeemaker having an upright C-shaped housing, one horizontal leg having a heated carafe support and the other a water spreader, the vertical leg enclosing an accessible water reservoir with an apertured bottom wall and a pump and hot water generator in the bottom of said housing for delivering heated water through tube means to the spreader, the improvement comprising,

a separate plenum chamber with a single inlet and outlet connected in said tube means,

said chamber being connected in series flow relationship in said tube between the hot water generator and said spreader,

a one-way inlet valve between the reservoir and hot water generator,

a one-way outlet valve adjacent the chamber exit preventing back-flow through the chamber,

said chamber and outlet valve being connected in series flow relationship in said tube between the hot water generator and said spreader and disposed as the only connected component between the heated carafe support and said spreader so all water from the generator flows unidirectionally through said plenum chamber to said spreader to eliminate steaming and reduce clogging.

4,356,383

THERMOSTATICALLY CONTROLLED ELECTRIC FLUID HEATING APPARATUS

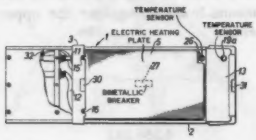
Bengt A. G. Dahlberg, Lund; Bengt M. Holmberg, Bjarred, and Lennart O. E. Nilsson, Genarp, all of Sweden, assignors to Gambro AB, Sweden

Filed Nov. 20, 1979, Ser. No. 96,001

Claims priority, application Sweden, Nov. 22, 1978, 7812016

Int. Cl.³ H05B *1/02;* **B67D** *5/62;* **A61F** *7/00;* **F24H** *1/12*

U.S. Cl. 219—308 **17 Claims**



1. A heating apparatus for heating of a fluid comprising:

a conduit having a fluid passage therethrough for conduction of a fluid to be heated;

heating means in heat transfer contact with a portion of said conduit for heating the fluid being conducted therethrough;

temperature sensing means positioned in engagement with said conduit at a predetermined location along said conduit external to said conduit for sensing the temperature of fluid to be conducted through said conduit;

means operatively associated with said temperature sensing means for controlling operation of said heating means in response to the temperature of the fluid sensed by said temperature sensing means; and

constricting means associated with said conduit for maintaining the fluid in said fluid passage in contact with said conduit at said predetermined location when the flow rate of said fluid through said fluid passage is below a predetermined flow rate so as to guide the fluid in said conduit in temperature sensing relationship with said temperature sensing means, said constricting means being responsive to the flow rate of fluid through said fluid passage at said predetermined location to vary the cross-sectional area of the fluid passage between a predetermined cross-section area when the flow rate of said fluid is below a predetermined flow rate and a larger cross-sectional area when the flow rate of said fluid is above said predetermined flow rate, said predetermined cross-sectional area being of a size less than the unconstricted cross-sectional area of said fluid passage in said portion of said conduit in heat tranfer contact with said heating means.

4,356,384

METHOD AND MEANS FOR HEAT TREATING SEMICONDUCTOR MATERIAL USING HIGH INTENSITY CW LAMPS

Arnon Gat, 1875 Newell Rd., Palo Alto, Calif. 94303

Division of Ser. No. 126,458, Mar. 3, 1980, Pat. No. 4,331,485. This application Mar. 2, 1981, Ser. No. 239,425

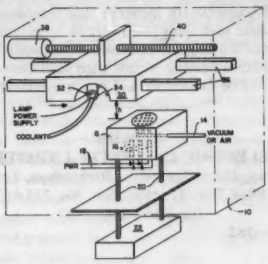
Int. Cl.³ H05B *1/00*

U.S. Cl. 219—347 **8 Claims**

1. Apparatus for heat treating a semiconductor wafer comprising

a heated support for holding and heating a semiconductor wafer,

a high intensity incoherent CW light source positionable with respect to said support for radiation heating of a wafer held on said support, and



means for effecting relative motion between said light source and said support whereby the entire surface of a wafer can be scanned by said light source.

4,356,385

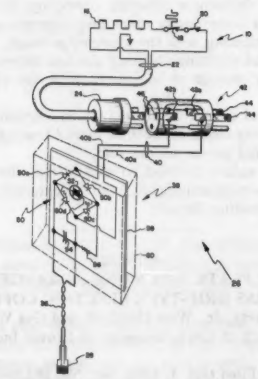
APPARATUS FOR PRECISELY REGULATING THE PARAFFIN TEMPERATURE IN AN ELECTRICALLY HEATED TISSUE PROCESSOR

Arthur A. Stein, Albany, and Max Goldman, Latham, both of N.Y., assignors to Pathology Products Ltd., Albany, N.Y.

Filed Jun. 1, 1981, Ser. No. 268,686

Int. Cl.³ H05B *3/06*

U.S. Cl. 219—441 **10 Claims**



6. In combination with an electrically heated tissue processor configured of a paraffin-containing cavity, a heating element affixed to the underside of the cavity for heating the paraffin contained therein when the heating element is energized with alternating current, a bimetallic thermostatic switch and a line cord having a plug at the end thereof for coupling the heating element and bimetallic switch across a source of alternating current, apparatus for precisely regulating the temperature of paraffin heated in the paraffin-containing cavity by the heating element, said apparatus comprising:

a sensor responsive to the temperature of paraffin heated in the paraffin-containing cavity by the heating element, said sensor changing conduction states from a first to a second state when the temperature of paraffin in the paraffin-containing cavity rises above a predetermined temperature;

clamp means for detachably securing said sensor to paraffin containing cavity so that at least a portion of said sensor is immersed in the paraffin in said paraffin-containing cavity;

controller means electrically coupled to said sensor and

being responsive to the conduction state of said sensor for providing a low impedance circuit path thereacross for alternating current during intervals while said sensor remains in its first conduction state and for providing a high impedance circuit path thereacross for alternating current during intervals while said sensor remains in its second conduction state following a rise in paraffin temperature above said predetermined temperature; and

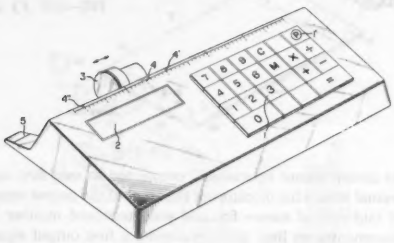
means coupled to said controller means for detachably coupling said controller means in series with the tissue processor heating element and bimetallic thermostatic switch across a source of alternating current.

4,356,386

DESK-TOP CALCULATOR

Takayoshi Hanagata, Yamato, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 28, 1979, Ser. No. 107,940
Claims priority, application Japan, Jan. 30, 1979, 54-9369
Int. Cl.³ G06C *11/04*
U.S. Cl. 235—61 PK **2 Claims**



1. A calculator having:

a rotatable character wheel having a character surface on which a plurality of characters are provided, wherein ink is supplied to the character surface from an ink roller;

means for causing said character wheel to move toward a printing position, and for transferring the ink on a selected character of said character wheel to an arbitrary printing paper on a desk or table by means of urging said character wheel to the printing paper; and

means for returning said character wheel to an initial position when the calculator is lifted.

4,356,387

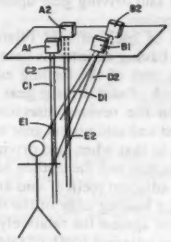
APPARATUS FOR COUNTING THE NUMBER OF OBJECTS PASSING A GIVEN POINT

Naoki Tsubota, and Satoru Shibuya, both of Kyoto, Japan, assignors to Giken Trading Co., Ltd., Kyoto, Japan

Filed Jun. 11, 1979, Ser. No. 47,324
Claims priority, application Japan, Jul. 21, 1978, 53-89697
Int. Cl.³ G07C *9/00*
U.S. Cl. 235—92 PK **3 Claims**

1. An apparatus for counting the number of persons passing a given point comprising:

at least one radiant energy emitter and at least one corresponding radiant energy receiver provided on a ceiling above said given point, said radiant energy receiver being provided at an angle to said radiant energy emitter and being arranged and configured together with said radiant energy emitter such that the radiant energy emitted by said radiant energy emitter only intersects an extension of a radiant energy reception path of said radiant energy receiver in an area of intersection having a low point located at a height corresponding to substantially the minimum height of a person to be counted whereby said radiant energy receiver receives radiant energy only while a person to be counted is passing through the area of intersection and said radiant energy emitted by said radiant energy emitter is reflect from a head or shoulders of said person to be counted;



means for generating a signal corresponding to the reception of said reflected radiant energy; and

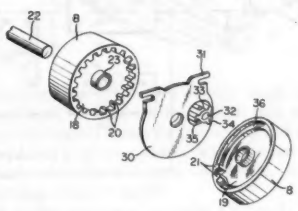
a means coupled to said receiver for counting said signals.

4,356,388

ODOMETER

Yasuyuki Kobayashi; Hisao Nezu, and Etsushi Nishikata, all of Nagaoka, Japan, assignors to Nippon Seiki Kabushiki Kaisha, Niigata, Japan

Filed Feb. 13, 1980, Ser. No. 120,990
Claims priority, application Japan, Feb. 17, 1979, 54-19139[U]
Int. Cl.³ G01C *22/00*
U.S. Cl. 235—96 **1 Claim**



1. A unidirectional odometer, comprising:

a supporting shaft;

at least two digit wheels rotationally mounted on said shaft in mutual juxtaposition,

each of said wheels being I-shaped in cross-section taken therethrough in the plane of the longitudinal axis of said shaft, with a first circular recess on the least significant digit side thereof and a second circular recess on the most significant digit side thereof;

a driven gear comprising a continuous series of teeth formed on the inner circumference of said first circular recess;

a circular step peripheral to said second circular recess;

a driving gear comprising two adjacent teeth formed on the inner circumference of said second circular recess outside said step and occupying only a minor portion thereof, the remainder of said inner circumference of said second circular recess being untoothed;

a pinion gear holder disposed between said digit wheels;

a pinion gear mounted on said pinion gear holder for rotation about an axis parallel to and spaced apart from said shaft to unidirectionally couple said driving gear to said driven gear;

said pinion gear having a first group of relatively circumferentially short teeth and a second group of relatively circumferentially long teeth interspersed therewith, so that each tooth of one group is surrounded by two teeth of the other group,

each of said groups of teeth having a forward face for engag-

ing the teeth of said driving gear to permit rotation of said driving gear, pinion gear and driven gear in a desired forward direction, and an opposite rear face for engaging the teeth of said driving gear upon rotation thereof in the reverse direction,

the rear face of each of said relatively circumferentially short teeth having an intermediate shoulder for receiving an adjacent part of the leading edge of one of said two adjacent teeth of said driving gear when said driving gear is rotated in the reverse direction, said shoulder being dimensioned and said pinion gear teeth being dimensioned and spaced so that when said driving gear is rotated in the reverse direction and the leading edge of the leading tooth of said two adjacent teeth of said driving gear engages said shoulder, the leading edge of the other tooth of said driving gear jams against the relatively circumferentially long surface of an adjacent tooth of said pinion gear to prevent rotation thereof in said reverse direction; and

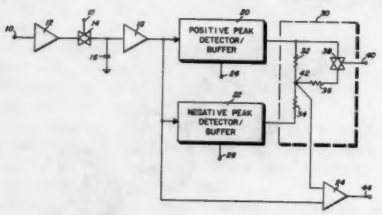
means for rotating the least significant digit wheel, including a pair of elastic arms having front ends in engagement with the teeth of the driven gear thereof.

4,356,389

BAR CODE SCANNER INTERFACE

Tim A. Quirey, Davie, and Thomas V. D'Amico, Boca Raton, both of Fla., assignors to Motorola Inc., Schaumburg, Ill.

Filed Jun. 27, 1980, Ser. No. 163,855
Int. Cl.³ G06K *7/14*
U.S. Cl. 235—455 **8 Claims**



1. An interface circuit as for a bar code scanner and comprising:

DC coupled input means for receiving a signal varying in DC level and peak values;

positive peak detector means coupled to the input means;

negative peak detector means coupled to the input means;

reset means coupled to reset the peak detectors during each signal cycle, one after each signal transition;

switchable reference means coupled to the positive and negative peak detector means outputs for providing a reference signal having an instantaneous value equal to the last detected peak value summed with a fixed fraction of the difference between the last detected peak value and the presently detected peak value, said fixed fraction being substantially greater than one-half;

comparator means coupled to the outputs of the input means and the switchable reference means; and

output means coupled to the comparator means.

4,356,390

OPTICAL PATH MONITORING CIRCUIT FOR A DOCUMENT SCANNER

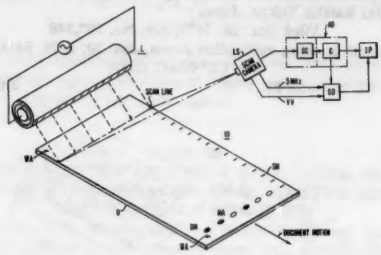
Michal M. Feilchenfeld, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 11, 1981, Ser. No. 242,755
Int. Cl.³ G06K *9/00*
U.S. Cl. 235—455 **2 Claims**

1. In a document reading system employing an optical means for scanning information on a line-by-line basis from the surface of a document and generating a first output signal indicative of the level of light reflected from, or transmitted through the document for each scan line, and a second output signal indicative of the occurrence of each scan line, the improvement for alerting the system as the presence of dirt, smudges, etc. in the optical path of the optical means which could adversely affect the validity of information received by the system, said improvement comprising,

first circuit means for developing output signals indicative of the presence of a document within the view of said optical means,

second circuit means for designating a predetermined number of document scan lines within a blank portion of the document surface to provide a basis for monitoring the optical path of the system, and



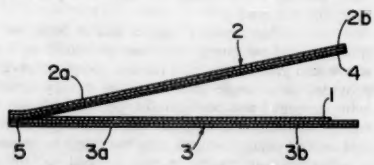
third circuit means operatively connected to said first and second means for monitoring the level of the output signal of said optical means for said predetermined number of document scan lines and developing a first output signal when the output signal of said optical means for each of said predetermined number of document scan lines is of a level indicative of the absence of dirt, smudges, etc. in the optical path, and developing a second output signal when the output signal of said optical means for one or more of said predetermined number of document scan lines is of a level indicative of the presence of dirt, smudges, etc. in the optical path, said second output signal being provided to said system to alert said system as to the presence of dirt, smudges, etc. in the optical path of said optical means.

4,356,391

MAGNETIC CARDS AND METHOD OF MANUFACTURING THE SAME

Shigekazu Takeda, 21-10, Nishiminemachi, Ohta-Ku, Tokyo, Japan

Filed Dec. 24, 1980, Ser. No. 220,085
Claims priority, application Japan, Dec. 28, 1979, 54-181360[U]; Dec. 28, 1979, 54-181361[U]; May 2, 1980, 55-57911
Int. Cl.³ G06K *19/02*
U.S. Cl. 235—493 **8 Claims**



1. A magnetic card comprising:

a sheet having printed or written matter thereon;

a transparent resinous upper pack film having an inner sur-

face facing said sheet, said upper pack film overlying said sheet;

a magnetic band bonded to said inner surface of said upper pack film; and

resinous lower pack film underlying said sheet;

peripheral portions of said upper and lower pack films being bonded together to seal said sheet and said magnetic band between said upper and lower pack film.

4,356,392

OPTICAL IMAGING SYSTEM PROVIDED WITH AN OPTO-ELECTRONIC DETECTION SYSTEM FOR DETERMINING A DEVIATION BETWEEN THE IMAGE PLANE OF THE IMAGING SYSTEM AND A SECOND PLANE ON WHICH AN IMAGE IS TO BE FORMED

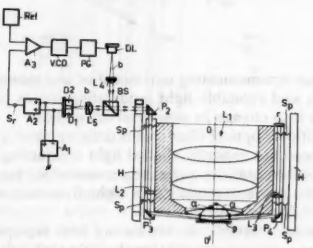
Stefan Wittekoek, and Theodorus A. Fahner, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 11, 1980, Ser. No. 158,653

Claims priority, application Netherlands, Dec. 6, 1979, 7904579

Int. Cl.³ G01J *1/20*

U.S. Cl. 250—201 **5 Claims**



1. In an optical system for imaging an object such as a mask pattern or the like, an apparatus for detecting a deviation between an image plane of the imaging system and a second plane on which the object is to be imaged, said apparatus comprising means for producing an auxiliary beam of radiation which is directed toward said second plane along a first path and is reflected from said second plane along a second path, means disposed in said first path for focusing said beam to a first spot on said second plane, means disposed in said second path for directing the beam reflected by said second plane back along itself towards said second plane, said directing means being coupled to said imaging system and comprising means for inverting the beam directed back along said second path and focusing the inverted beam to a second spot at the location of said first spot on said second plane so that said beam is reflected a second time by said second plane, and radiation-sensitive detector means disposed in the path of said beam reflected for said second time, said detecting means producing an electrical signal representative of the deviation of said image plane from said second plane.

4,356,393

ALIGNMENT INDICATOR FOR PHOTOELECTRIC SCANNERS

Robert W. Fayfield, Excelsior, Minn., assignor to Banner Engineering Corp., Minneapolis, Minn.

Filed May 29, 1980, Ser. No. 154,223

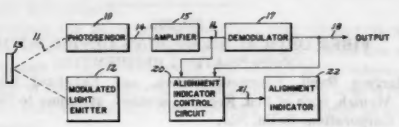
Int. Cl.³ H01J *40/14*

U.S. Cl. 250—214 R **15 Claims**

1. Photoelectric measuring and indicating apparatus, comprising:

light responsive means for receiving light and producing an intensity signal indicative of the intensity of the received light;

control means connected to receive said intensity signal and operative in response thereto to produce an output having a frequency that varies with the intensity of the received light; and



an indicator connected to receive said output and operative in response thereto to produce a repetitive indication synchronous with said output frequency whereby the intensity of the received light may be discerned.

4,356,394

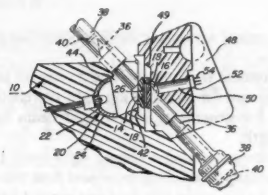
APPARATUS FOR APPLYING RADIANT BEAM

Richard W. Cobean, Libertyville; Michael F. Wicnienski, Antioch, and Gary Feldman, Wilmette, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jan. 30, 1981, Ser. No. 230,076

Int. Cl.³ G01J *1/20*

U.S. Cl. 250—222 R **18 Claims**



1. In apparatus for applying a radiant beam against an opaque diaphragm, to melt an aperture in said diaphragm, which comprises bracket means for positioning said diaphragm at a predetermined position, a source of said radiant beam, and electric circuit means for activating said source, the improvement comprising, in combination:

photocell means positioned whereby a properly positioned diaphragm initially shades said photocell means from the beam and said beam strikes said photocell when said aperture is formed, and means to shut off said radiant beam responsive to the beam striking said photocell.

4,356,395

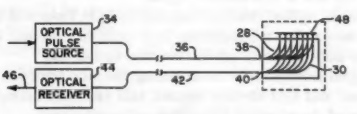
DIGITAL FIBER OPTIC SENSOR SYSTEM

Glen E. Miller, Redondo, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jul. 6, 1979, Ser. No. 55,438

Int. Cl.³ G02B *5/14*; H03K *13/02*

U.S. Cl. 250—227 **9 Claims**



1. Apparatus for converting a single optical pulse into a serial train of time-multiplexed pulses of essentially uniform amplitude and shape, comprising means for simultaneously directing a single light pulse onto the ends of optical fibers such that each fiber receives the same amount of light, the fibers being of different lengths whereby the pulses emanating from all of the opposite ends of the fibers will be delayed one with respect to the other, said pulses emanating from the opposite ends of the fibers being directed onto reflective surfaces and

being thereafter reflected back through the optical fibers of different lengths to a single optical fiber where they pass through said single fiber as a serial train of pulses.

4,356,396

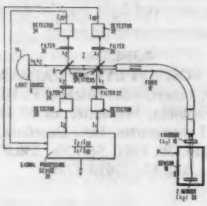
FIBER OPTICAL MEASURING DEVICE WITH COMPENSATING PROPERTIES

Hartwig Ruell, Fuerstenfeldbruck, and Ekkehard Klement, Munich, both of Fed. Rep. of Germany, assignors to Siemens Corporation, Iselin, N.J.

Filed Dec. 17, 1980, Ser. No. 217,452

Int. Cl.³ G02B *5/14*

U.S. Cl. 250—227 **13 Claims**



1. A fiber optical measuring device, comprising in combination:

(a) a fiber optical transmission line having an input end and an output end for transmitting light therebetween;

(b) means for generating a first light beam having a first wavelength;

(c) means for generating a second light beam having a second wavelength differing from said first wavelength;

(d) means for directing said first and second light beam into said input end of said transmission line, said first and said second light beam thereby being transmitted from said input end to said output end of said transmission line;

(e) a first mirror associated with said output end for passing at least a portion of said transmitted second light beam therethrough and for reflecting at least a portion of said transmitted first light beam back into said transmission line, the reflected first light beam thereby being transmitted from said output end to said input end thereof;

(f) a sensor associated with said output end for measuring a physical parameter, for receiving said second light beam and returning a portion of said second beam dependent upon the physical parameter back into said output end of said transmission line;

(g) an optical device arranged with said input end for separating the reflected portion of said first light beam from the returned portion of said second light beam;

(h) a first optical detector exposed to light from said optical device for transforming said reflected first light beam portion into a first electric signal;

(i) a second optical detector exposed to light from said optical device for transforming said returned second light beam portion into a second electric signal; and

(j) a signal processor for determining the ratio between said second and first electric signals, said ratio indicating the value of the physical parameter to be measured.

4,356,397

OPTICAL VALVE POSITION SENSOR SYSTEM

Bruce N. Lenderking, Glen Burnie, Md., and Donald P. Garrett, Jacobus, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 18, 1980, Ser. No. 160,412

Int. Cl.³ G01D *5/34*

U.S. Cl. 250—231 SE **5 Claims**

1. A valve condition sensor operable with a valve having a movable member the position of which is indicative of the degree of opening of said valve, comprising:

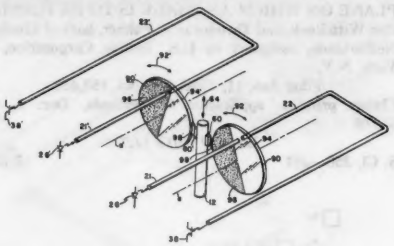
(A) optical fiber means defining first and second separated but optically aligned light conducting sections;

(B) light transmitter means operable to project a light beam into said first section;

(C) light receiver means positioned to intercept any of said light emanating from said second section;

(D) a light modulating means in the form of a rotatable shutter having both transparent and opaque sections rotatable into the light path between said first and second light conducting sections;

(E) said rotatable light modulating means being positioned proximate said movable member of said valve;



(F) means communicating movement of said movable member to said rotatable light modulating means to thereby rotate it to change its positional orientation;

(G) additional optical fiber means defining third and fourth separated but optically aligned light conducting sections;

(H) optical transmitter and receiver means for transmission of light into and reception of light from said additional optical fiber means;

(I) a second rotatable shutter having both transparent and opaque sections rotatable into the light path between said third and fourth light conducting sections;

(J) said second shutter being rotatable in response to movement of said movable member of said valve; and

(K) said shutters being oriented such that during normal operation only one of said shutters will allow light transmission at a time.

4,356,398

METHOD OF PROCESSING RADIOGRAPHIC IMAGE

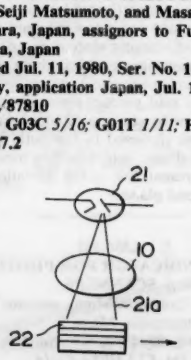
Takao Komaki; Seiji Matsumoto, and Masamitsu Ishida, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 11, 1980, Ser. No. 168,800

Claims priority, application Japan, Jul. 11, 1979, 54/87809; Jul. 11, 1979, 54/87810

Int. Cl.³ G03C *5/16*; G01T *1/11*; H04N *1/40*

U.S. Cl. 250—327.2 **14 Claims**



1. A method of processing a radiographic image in a radiographic image recording system in which a stimulable phosphor plate is exposed to X-rays passing through an object to record a radiographic latent image of the object in the form of energy of X-rays stored therein, the stimulable phosphor plate is then exposed to stimulating rays to emit light according to the energy of X-rays stored therein, the emitted light is de-

tected by a photodetecting means and converted to an image signal and the image signal is used for recording a visible image on another recording material,

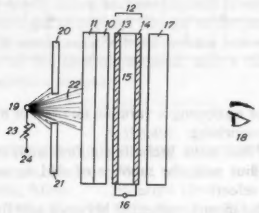
said processing method comprising recording images of the same object from the same direction on a plurality of said stimulable phosphor plates, superposing the image signals obtained from the plurality of stimulable phosphor plates to obtain an image signal having averaged image information, and enhancing the contrast of said image signal thus obtained by a gradation processing.

4,356,399

TRANSPARENCY CONTRAST ENHANCEMENT SYSTEM USING A PLANAR ULTRAVIOLET SOURCE

Albert Macovski, Menlo Park, Calif., assignor to Maxim Diagnostic Imaging, Palo Alto, Calif.

Filed Oct. 17, 1980, Ser. No. 198,218
Int. Cl.³ G01N *21/64*
U.S. Cl. 250—461.1 **9 Claims**



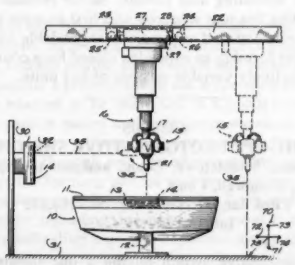
1. Apparatus for viewing a transparency comprising a phosphorescent screen on which the transparency is placed and a planar structure which transmits visible light and produces ultraviolet light which is placed adjacent to the transparency between the transparency and the viewer.

4,356,400

X-RAY APPARATUS ALIGNMENT METHOD AND DEVICE

Emanuel V. Polizzi, Hartland, and David G. Lieder, Waukesha, both of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 4, 1980, Ser. No. 175,162
Int. Cl.³ G03B *41/16*
U.S. Cl. 378—138 **6 Claims**



1. A method of enabling visualization of the central ray of an x-ray beam emitted from a focal spot of an x-ray tube in a casing that has a port through which an x-ray beam may be projected and is mounted for moving relative to at least one image receptor plane in a diagnostic x-ray system, said method comprising the steps of:

installing a central ray locator device housing in an adapter which is mounted to said casing at said port and is movable transversely of the direction in which the x-ray beam is to be projected, the locator device including an element having a hole whose axis is directed at said focal spot for passing a central ray aligned with said axis, said device having a phosphor screen spaced from said hole and said screen having crosshairs on whose intersection the axis of said hole projects,

energizing the x-ray tube and shifting said adapter as required until the bright spot visible on said screen due to passage of rays through said hole occurs at the intersection of said crosshairs as an indication that the central ray has been located, and then clamping said adapter to said casing,

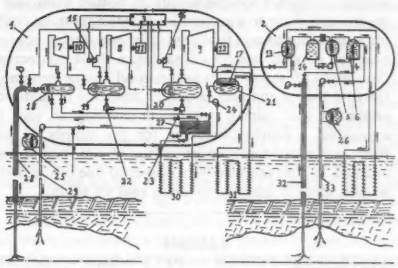
then substituting for said locator device in said adapter a housing in which there is a laser mounted in said housing such that its output beam is concident with the same axis as said hole and said crosshairs so that when said laser is energized its beam will produce a visible light spot where the invisible central x-ray would impinge.

4,356,401

THERMO-ELECTRIC POWER STATION SUPPLIED BY GEOTHERMAL HEAT SOURCE

Gianio G. Santi, Via Fratelli Gabba 6, Milan, Italy

Filed Jun. 19, 1980, Ser. No. 161,007
Claims priority, application Italy, Jul. 3, 1979, 24057 A/79
Int. Cl.³ F03G *7/00*
U.S. Cl. 290—1 R **6 Claims**



1. A thermo-electric power station, supplied by a geothermal heat source, in which water being heated in the subsoil, transfers its energy to at least one power-generating machine, characterized by the fact that the power station operates with water and carbon dioxide, comprising:

a source of water adapted to be heated by geothermal energy; means including at least one well (**29, 33**) for pumping the water into the subsoil; means including at least one insulated well (**28, 32**) for recovering the water heated to a pre-established temperature at the power station;

a source of carbon dioxide;

means (**18**) for bringing the carbon dioxide in direct contact with the water for absorbing the thermal energy in the water;

means (**7**) for transforming the thermal energy of the carbon dioxide into mechanical energy; and

pumping means (**22, 23**) for re-injecting the water into the subsoil.

4,356,402

ENGINE GENERATOR POWER SUPPLY SYSTEM

Izumi Morimoto, and Isao Sakamoto, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed May 28, 1981, Ser. No. 267,887
Claims priority, application Japan, Jun. 5, 1980, 55/78322[U]
Int. Cl.³ H02J *1/10*
U.S. Cl. 307—19 **4 Claims**

1. An engine generator power supply system comprising:

a plurality of engine generator;

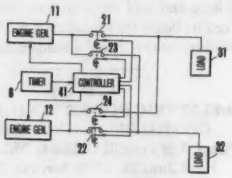
a plurality of separate power feed lines for independently feeding power from respective engine generators to a

plurality of loads respectively associated with the separate power feed lines;

contactor means inserted in each of the power feed lines, said contactor means being normally enabled for feeding power to said plurality of loads from one of the engine generators; and

control means for controlling such that the supply of power from a first engine generator to the plurality of loads is switched to the supply of power from a second engine generator to the plurality of loads at a predetermined time interval,

said contactors being sequentially enabled upon said switching such that after a first contactor for the supply of power from the first engine generator to a first load is disabled, a second contactor for the supply of power from said first engine generator to a second load continues to be enabled; after disabling of said first contactor and during continued enabling of said second contactor, a third contactor for the supply of power from said second engine generator to the first load is enabled; and after disabling of said second contactor and during continued enabling of said third contactor, a fourth contactor for the supply of power from said second engine generator to the second load is enabled, so that the supply of power to one of the first and second loads is continuous upon said switching.

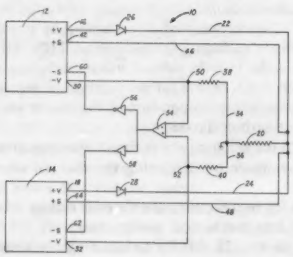


4,356,403

MASTERLESS POWER SUPPLY ARRANGEMENT

William D. Mohat, Euclid, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Feb. 20, 1981, Ser. No. 236,402
Int. Cl.³ H02J *1/04*
U.S. Cl. 307—60 **8 Claims**



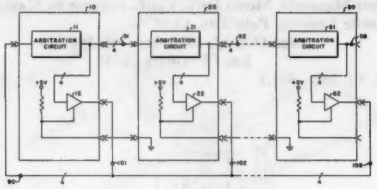
1. A power supply apparatus for supplying electrical power to a common load comprising a first power supply means electrically connected to said common load, a second power supply means electrically connected to said common load, means for detecting the existence of a difference in the output current (due to a difference in the output voltages) of said first and second power supply means, said detecting means being electrically connected to said common load and producing a signal proportional to said difference in said output voltage of said first and second power supplies, and means responsive to said signal produced by said detecting means causing the output voltage of one of said first and second power supply means to change so as to be approximately equal to the output voltage of the other of said first and second power supply means.

4,356,404

CIRCUIT FOR EQUIPPING A VARIABLE NUMBER OF BUS UNITS ON A CLOSED LOOP BUS

Joseph A. Comfort; Thomas J. Perry, and Michel Loos, all of Phoenix, Ariz., assignors to GTE Automatic Electric Labs Inc., Northlake, Ill.

Filed May 26, 1981, Ser. No. 267,165
Int. Cl.³ H01H *19/14*
U.S. Cl. 307—115 **6 Claims**



1. A circuit for equipping a variable number of bus units on a tri-state bus comprising:

a plurality of bus units including a first and at least one succeeding bus unit, the number of said succeeding bus units being selectively variable;

first tri-state bus means connected between said first bus unit and each said succeeding bus unit;

a plurality of tri-state buffer elements corresponding to said plurality of bus units, each said corresponding tri-state buffer element connected to said first bus unit via said first tri-state bus means;

sequentially expandable tri-state bus means connected between said first bus unit and said succeeding bus unit, said sequentially expandable tri-state bus means series connected between a succeeding bus unit and a next succeeding bus unit for each of said variable number of succeeding bus units;

means for connecting said tri-state buffer element of each corresponding bus unit to said next succeeding bus unit, each said succeeding bus unit effective to maintain said succeeding tri-state buffer element in a high impedance state;

means for operating said tri-state buffer element of a last succeeding bus unit whereby said first tri-state bus means is connected to said sequentially expandable tri-state bus means for forming an expanded closed loop connection of said selectively variable number of bus units.

4,356,405

FAIL-OFF PHOTOSENSITIVE SWITCH

John G. Russo, Middletown, Conn., assignor to Ripley Company, Inc., Cromwell, Conn.

Filed Jan. 21, 1980, Ser. No. 114,372
Int. Cl.³ H01H *43/30*
U.S. Cl. 307—117 **1 Claim**

1. A photosensitive switch having a line terminal and a neutral terminal adapted to be connected to a power supply and a load terminal adapted to be connected to a load to control the load in response to the ambient light level comprising:

a thermal relay having a heater and normally-open contact points, one side of said heater and one of said contact points being connected to said line terminal;

an SCR having its anode connected to the neutral terminal, its cathode connected to the other side of the heater, and further having a gate;

a voltage divider comprising a fixed resistor between the SCR anode and the SCR gate and a photosensitive resistor

between the SCR gate and the line terminal, said photosensitive resistor having a relatively low resistance at high light levels and a relatively high resistance at low light levels, the ratio of resistance of the fixed resistor to the photosensitive resistor being such that the SCR is energized below a preselected light level, and is maintained off at light levels above said preselected level; and

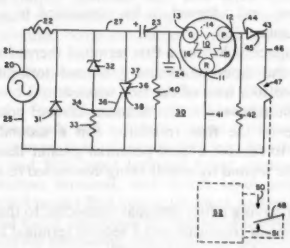
a fuse connected at one end thereof to the junction between the SCR anode and the fixed resistor and at the other end thereof to the neutral terminal, and a diode across the photosensitive resistor.

4,356,406

CONDUCTIVE FLUID PROBE POWERING MEANS

James I. Bartels, Hudson, Wis., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 17, 1981, Ser. No. 235,254
Int. Cl.³ G01F *23/00;* G08B *21/00*
U.S. Cl. 307—118 **8 Claims**



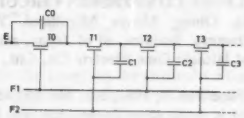
1. A power supply and control for a conductive fluid probe which is adapted to be connected to a source of voltage having alternating voltage phases, and wherein said probe has a guard ring intermediate a probe element and a common element with said probe adapted to be immersed in a conductive fluid, including: capacitor means and impedance means connected to said voltage source with said capacitor means being charged and discharged through said impedance means; said conductive fluid probe forming part of said impedance means when said probe is immersed in said conductive fluid; said impedance means further including unidirectional switch means connected to rapidly discharge said capacitor means through said impedance means including said fluid when said fluid is present, and with said switch means controlled by a first phase of said voltage source; diode means connected as part of said impedance means in a polarity opposite to said unidirectional switch means to conduct current from said voltage source on an alternate phase from said first voltage phase; amplifier means having input means connected to a portion of said impedance means with said amplifier means being responsive to the charge and discharge of said capacitor means through said conductive fluid; and said amplifier means having output means with said amplifier output means being responsive to the presence of said fluid at said probe.

4,356,407

INPUT CIRCUIT FOR BUCKET BRIGADE

Manfred F. Ullrich, Denzlingen, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Continuation of Ser. No. 19,397, Mar. 12, 1979, abandoned. This application Apr. 16, 1981, Ser. No. 254,707
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1978, 2813606
Int. Cl.³ G11C *19/28;* H03K *13/34*
U.S. Cl. 307—221 D **4 Claims**



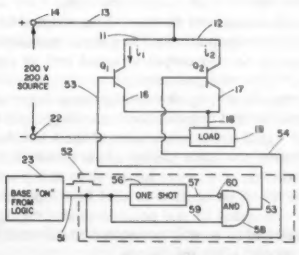
1. An insulated-gate field effect transistor bucket brigade circuit comprising a plurality of stage transistors each having a source, drain and gate connected in an array with the drain of each stage transistor connected to the source of another said stage transistor to define a like plurality of stages in said array, with the gates of said stage transistors in even-numbered stages interconnected for connection to a first clock signal and with the gates of said stage transistors in odd-numbered stages interconnected for connection to a second clock signal; a like plurality of stage capacitors, each of which is connected across the gate and drain of one of said stage transistors; and an input stage including an input transistor, having a source for providing an input terminal to said bucket brigade circuit, a drain connected to the source of said first stage transistor and a gate connected to the gates of said even-numbered stage transistor, and an input capacitor connected across the source and drain of said input transistor, wherby said bucket brigade circuit is isolated from ground to eliminate undesired ground potential variations.

4,356,408

DRIVE CIRCUIT FOR PARALLEL NON-MATCHED SEMICONDUCTORS

Timothy F. Glennon, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Aug. 1, 1980, Ser. No. 174,488
Int. Cl.³ H03K *17/00, 3/33, 3/01*
U.S. Cl. 307—254 **16 Claims**



1. A drive circuit coupled to electrical devices connected in parallel in a circuit network, said electrical devices having distinct total on-time periods when they are simultaneously energized, and then de-energized, said circuit network having a source of power coupled through said parallel connected electrical devices to a load, said drive circuit including in combination;

a signal source coupled respectively through a time adjustable circuit to a first electrical device and to a second electrical device, said time adjustable circuit being adjusted such that the total on-time of said first electrical device matches the total on-time of said second electrical device to thereby ensure equal current at all times through said electrical devices to said load while maintaining the distinct total on-time periods of said first and said second electrical devices.

4,356,409

LEVEL CONVERSION CIRCUIT

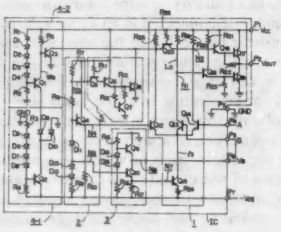
Kouji Masuda, Ohme; Masao Mizukami, Yokohama, and Nobuaki Kitamura, Kodaira, all of Japan, assignors to Hitachi, Ltd. and Hitachi Ome Electric Co., Ltd., both of Tokyo, Japan

Filed Jun. 9, 1980, Ser. No. 157,853

Claims priority, application Japan, Jun. 29, 1979, 54-81351; Sep. 3, 1979, 54-111777; Dec. 27, 1979, 54-169338

Int. Cl.³ H03K *5/01, 5/02*

U.S. Cl. 307—264 **5 Claims**



1. A level conversion circuit comprising:

a first and a second input transistor connected to each other at their emitters in a differential manner, the base of said first input transistor being connected to receive a predetermined voltage level;

a first load connected between the collector of said first input transistor and a positive source voltage;

a second load connected between the collector of said second input transistor and said positive voltage;

a current source connected between the emitters of said first and second input transistors and a negative source voltage;

a first output transistor having a base adapted to be driven by the output from the collector of said second input transistor, a collector connected to said positive source voltage and an emitter connected to an output terminal;

a second output transistor having a base adapted to be driven by the collector output of said first input transistor, a collector connected to said output terminal and an emitter connected to a grounding terminal;

a source voltage detecting circuit adapted to detect at least one of said positive and negative source voltages and to provide an output signal indicating a state of the level thereof;

a first protective transistor having a base to which is applied a biasing voltage of a level lower than the predetermined voltage level to be applied to said first input transistor, a collector connected to said positive source voltage through a third load and an emitter connected to said emitters of said first and second input transistors;

a second protective transistor having a base adapted to receive the output signal from said source voltage detecting circuit, an emitter connected to the grounding terminal and a collector connected to the collector of said first protective transistor; and

a capacitance separation element disposed between said collector of said second input transistor and said collectors of said first and second protective transistors.

4,356,410

PULSE TRANSMISSION AND REPETITION CIRCUIT

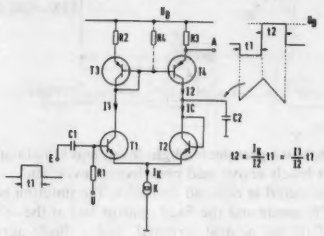
Leslie Miskin, Gundelfingen, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Aug. 27, 1980, Ser. No. 181,562

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1979, 2935917

Int. Cl.³ H03K *5/04, 4/50, 5/156*

U.S. Cl. 307—265 **2 Claims**



1. A circuit arrangement for receiving an input pulse and in response thereto, transmitting a first pulse equal in duration to the input pulse, and a second pulse having a duration proportional to that of the input pulse, said circuit comprising:

first and second transistors each having emitters commonly connected and adapted to be connected to a constant current source;

an input capacitor having a first terminal thereof adapted to receive the input pulse and a second terminal thereof connected to a base of the first transistor;

a first resistor having a first terminal thereof connected to the base of the first transistor and a second terminal adapted to receive a fixed potential greater than zero;

a base of the second transistor being connected to a collector thereof;

a capacitor having a first terminal connected to the collector of the second transistor and a second terminal adapted to be connected to a zero potential;

a third transistor of a type complementary to said first transistor having a collector connected to the collector of the first transistor so that said third transistor functions as a load transistor, the collector of said third transistor also being connected to a base of said third transistor;

a second resistor having a first terminal connected to an emitter of the third transistor and a second terminal adapted to be connected to an operating voltage, said operating voltage being greater then said fixed potential and of the same polarity;

a fourth transistor having a collector connected to the collector of said second transistor and being complementary thereto so as to function as a load transistor;

a base of said fourth transistor being connected to the base of said third transistor; and

a third resistor having a first terminal connected to an emitter of said fourth transistor and a second terminal adapted to be connected to said operating voltage, the emitter of said fourth transistor functioning as an output of said circuit for providing the transmitted pulses, the duration of the first transmitted pulse being equal to the duration of the input pulse and the duration of the second transmitted pulse being determined by the ratio of the collector currents of said third and fourth transistors.

4,356,411
FLIP-FLOP CIRCUIT

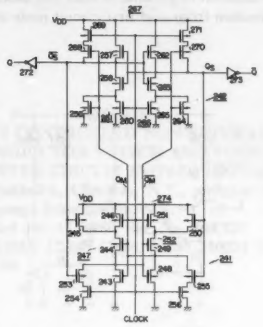
Yasoji Suzuki, Kawasaki, and Minoru Takada, Ohmori Nishi, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Dec. 7, 1979, Ser. No. 101,103

Claims priority, application Japan, Dec. 12, 1978, 53-153536; Dec. 12, 1978, 53-153537; Dec. 12, 1978, 53-153539; Dec. 12, 1978, 53-153540

Int. Cl.³ H03K *3/289*

U.S. Cl. 307—272 A **10 Claims**



1. A flip-flop circuit comprising:

a master flip-flop including a first logic gate circuit having a first input terminal and a first output terminal and a second logic gate circuit having a second input terminal and a second output terminal, said first input terminal being connected to said second output terminal and said second input terminal being connected to said first output terminal;

a slave flip-flop including a third logic gate circuit having third and fourth input terminals and a third output terminal and a fourth logic gate circuit having fifth and sixth input terminals and a fourth output terminal, said third input terminal being connected to said fourth output terminal, said fifth input terminal being connected to said third output terminal, said fourth input terminal being connected to said first output terminal, and said sixth input terminal being connected to said second output terminal;

first means for producing and supplying clock pulses to said master and said slave flip-flops;

second means connected to said first, third and fourth logic gate circuits for producing a preset signal for predetermining the output of said slave flip-flop; and

third means connected to said second, third, and fourth logic gate circuits for producing and supplying a clear signal for clearing the state of said master and said slave flip-flops.

4,356,412
SUBSTRATE BIAS REGULATOR

Jerry D. Moench, and Rodney C. Tesch, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 17,523, Mar. 5, 1979, abandoned. This application May 5, 1981, Ser. No. 260,571

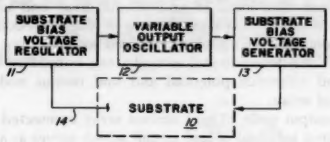
Int. Cl.³ H03K *3/01, 3/353*

U.S. Cl. 307—304 **6 Claims**

1. A substrate bias voltage regulator for controlling a substrate bias voltage generator to provide a predetermined substrate bias voltage to a semiconductor substrate, comprising:

a first field effect transistor having a first electrode and a gate electrode coupled to a first supply voltage, and a second electrode;

a second field effect transistor having a first electrode coupled to the second electrode of the first transistor, a second electrode connected directly to the substrate, and a gate electrode directly connected to ground without intervening elements, the second transistor developing a control voltage on the first electrode thereof which is related to the deviation from the predetermined substrate bias voltage of the bias voltage developed on the substrate by the substrate bias voltage generator; and



amplifier means for coupling the control voltage developed on the first electrode of the second transistor to the substrate bias voltage generator to control the operation thereof.

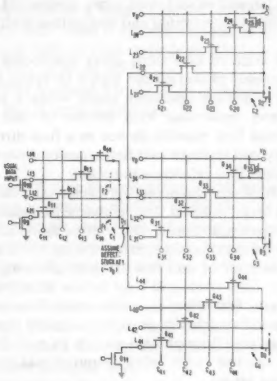
4,356,413
MOSFET CONVOLVED LOGIC

William Rosenbluth, and Thomas A. Williams, both of Reston, Va., assignors to IBM Corporation, Armonk, N.Y.

Filed Aug. 20, 1980, Ser. No. 179,847

Int. Cl.³ H03K *19/003, 19/017, 19/173;* **G01R** *15/12*

U.S. Cl. 307—443 **2 Claims**



1. An FET logic circuit including a plurality of convolved logic arrays, each array having non-thresholded path routing to eliminate logic transition times in the critical data path, for enabling stuck fault testing of embedded ones of said arrays, comprising:

a first convolved logic array including a first FET data input device having its gate connected to a first data input source and its source/drain path connected between a first data path and a first reference potential;

a second FET data input device in said first array, having its gate connected to a second data input source and its source/drain path connected between a second data path and said first reference potential;

a first FET transfer device in said first array, having its source/drain path connected in said first data path between said first data input device and an output node of said first array, having its gate input connected to a first control signal path of said first array;

a second FET transfer device in said first array, having its source/drain path connected in said second data path between said second data input device and said output node of said first array, having its gate input connected to a second control signal path of said first array;

a second convolved logic array including a first FET transfer

device having its source/drain path connected in a first data path between said output node of said first array and an output node of said second array, having its gate input connected to a first control signal path of said second array;

a second FET transfer device in said second array, having its source/drain path connected in a second data path between a second data input of said second array and said output node of said second array, having its gate input connected to a second control signal path of said second array;

an FET load device in said second array, connected between a second reference potential and said output node of said second array;

said output node of said second array connected to a first output terminal of said circuit which serves as a first data output in a normal operating mode when a current selectively flows from said load device through said first transfer device in said second array and through said first transfer device of said first array to said first reference potential;

a third convolved logic array including a first FET transfer device having its source/drain path connected in a first data path between said output node of said first array and an output node of said third array, having its gate input connected to a first control signal path of said third array;

a second FET transfer device in said third array, having its source/drain path connected in a second data path between a second data input of said third array and said output node of said third array, having its gate input connected to a second control signal path of said third array;

an FET load device in said third array, connected between said second reference potential and said output node of said third array;

said output node of said third array connected to a second output terminal of said circuit which serves as a second data output in a normal operating mode when a current selectively flows from said load device of said third array through said first transfer device in a first direction in said third array and through said first transfer device of said first array to said first reference potential;

a switch selectively connected between said output node of said third array and said first reference potential, for remaining in an open state during said normal mode and for closing during a testing mode to enable testing for a stuck fault at said output node of said first array by allowing a current to selectively flow from said load device in said second array through said first transfer device in said second array and through said first transfer device in a second direction in said third array and through said switch to said first reference potential, the test result being output at said output node of said second array;

whereby stuck fault testing of embedded ones of said arrays can be selectively performed.

4,356,414

MONOLITHICALLY INTEGRABLE LOGIC CIRCUIT

Helmut Güntner, Gräfelfing, and Ernst Wittenzellner, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

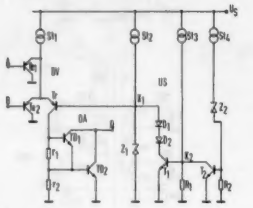
Filed Jan. 17, 1980, Ser. No. 113,119

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1979, 2903659

Int. Cl.³ H03K *19/086, 19/092*

U.S. Cl. 307—455 **7 Claims**

1. Monolithically integrable logic circuit having at least one NAND function and a Darlington stage serving as the signal output of the circuit, comprising a differential amplifier having its non-inverted output connected to the input of the Darlington stage, said differential amplifier including at least two identical input transistors with control electrodes which form the signal inputs of the circuit and a reference transistor which is identical to said input transistors, said reference transistor having one of its current carrying electrodes connected to the same current carrying electrodes of said input transistors, a current source connected to the connection of said input and reference transistor electrodes, switch-over means including transistors and diodes for switching said input transistors to different threshold voltage values, said switch-over means being connected to the control electrode of said reference transistor and said switch-over means including a first current source, a first circuit node connected to said first current source and forming the connection of said switch-over means to the control electrode of said reference transistor, a first Zener diode connected in the blocking direction from said first circuit node to ground, a first transistor having its emitter electrode connected to ground, at least one diode connected in the flow direction from said first circuit node to the collector



electrode of said first transistor, a second circuit node connected to the control electrode of said first transistor, a first leak resistor connected between said second circuit node and ground, a second current source connected to said second circuit node, a second transistor havings its collector electrode connected to said second circuit node and its emitter electrode connected to ground, a voltage divider connected to the control electrode of said second transistor, and a third current source, said voltage divider being formed of a series circuit of a second leak resistor connected to ground and a second Zener diode connected in the blocking direction to said second leak resistor with its cathode connected to said third current source.

4,356,415

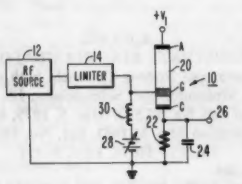
FREQUENCY DISCRIMINATOR UTILIZING A TRANSFERRED ELECTRON DEVICE

Fred Sterzer, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 14, 1980, Ser. No. 168,044

Int. Cl.³ H03D *3/26;* **H03K** *17/56, 17/04*

U.S. Cl. 307—522 **4 Claims**



1. A frequency discriminator circuit responsive to an input radio frequency signal of a given amplitude for producing an output signal having a value representative of the frequency of the input signal comprising, in combination:

a three terminal transferred electron device (TED) having an anode terminal, a cathode terminal, and a gate terminal;

an output circuit coupled in series with said TED;

means for applying said input signal to said gate terminal; and

means coupled to said anode, cathode and gate terminals for biasing said TED such that nucleation occurs in the TED only in response to the peak in one sense of each cycle of input signal at said gate terminal whereby the signal appearing at the output circuit is a measure of input frequency.

4,356,416

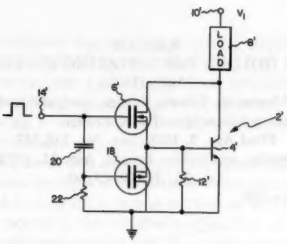
VOLTAGE CONTROLLED NON-SATURATING SEMICONDUCTOR SWITCH AND VOLTAGE CONVERTER CIRCUIT EMPLOYING SAME

Richard C. Weischedel, Camillus, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 17, 1980, Ser. No. 169,737

Int. Cl.³ H03K *17/04, 17/16, 17/56;* **H02M** *7/537*

U.S. Cl. 307—570 **3 Claims**



1. A voltage controlled semiconductor switch comprising:

(a) a bipolar transistor having base, emitter and collector electrodes,

(b) first means for coupling the collector-emitter current path of said bipolar transistor between a voltage source and a voltage reference point,

(c) a driver field effect transistor having source, drain and gate electrodes, and exhibiting a high input impedance at its gate electrode and a finite on resistance between its drain and source electrodes,

(d) second means for coupling the drain-source current path of said field effect transistor from said collector electrode to said base electrode for conducting the bipolar transistor base current as a portion of the current flowing in said collector-emitter path, said gate electrode being responsive to a control signal for controlling the base current conduction so as to switch on and off said bipolar transistor, whereby said bipolar transistor is prevented from going into saturation by operation of said field effect transistor so as to enhance the switching speed of said bipolar transistor,

(e) an auxiliary current path coupled from said base electrode to the emitter side of said collector-emitter current path for contributing to a rapid switching off of said bipolar transistor, said auxiliary current path including the drain-source current path of another field effect transistor of opposite conductivity type to that of said driver field effect transistor, the gate electrode of said other field effect transistor being also responsive to said control signal.

4,356,417

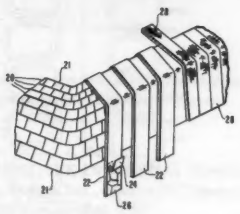
CATECHOL OR PYROGALLOL CONTAINING FLEXIBLE INSULATING TAPE HAVING LOW GEL TIME

James D. B. Smith, Wilkins Township, Allegheny County, and Robert N. Kauffman, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 39,918, May 17, 1979, Pat. No. 4,296,018. This application Sep. 17, 1980, Ser. No. 188,169

Int. Cl.³ H02K *1/04;* **B05D** *5/12*

U.S. Cl. 310—43 **17 Claims**



1. A method of making a flexible mica insulating tape comprising

(A) preparing a composition which comprises:

(1) semi-solid epoxide, a mixture of solid epoxide and liquid epoxide or a mixture of semi-solid epoxide and liquid epoxide, with a solvent for said epoxide, where the weight ratio of total epoxide to total solvent is from about 85:15 to about 10:90;

(2) about 0.01 to about 5.0 phr of an organotin compound having the structural formula:

$$R_3SnX$$

where each R is an organic group and X is selected from the group consisting of halide, hydroxide, acetate, butyrate, propionate, and dimethyl phosphate; and

(3) about 0.001 to about 1 phr of an activator selected from the group consisting of catechol, pyrogallol, and mixtures thereof;

(B) applying said composition to a flexible sheet material comprising mica, so that said organo-tin compound contacts said mica causing the organo-tin compound to act as a latent catalyst; and

(C) removing at least 95 weight percent of the solvent from the epoxide-solvent-organo-tin admixture in said sheet material without any substantial curing of the epoxide or reaction of the organo-tin compound, forming a flexible sheet with substantially unreacted epoxide and causing an increased amount of substantially unreacted organo-tin compound to contact mica in the sheet material; wherein the amount of organo-tin compound added is effective to advance the epoxide in the sheet material from the substantially unreacted state to a cured thermoset state upon heating over an epoxide-catalyst temperature of 150° C.

7. A method according to claim 1 wherein said epoxide is about 5 to about 25% by weight of the weight of said mica tape.

8. A method according to claim 7 including the additional last steps of wrapping said tape around a motor coil, vacuum-pressure impregnating said wrapped tape with an impregnating resin, and curing said resin and said epoxide.

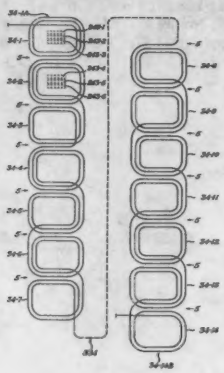
10. An insulating tape made by the method of claim 1.

11. A tape according to claim 10 wrapped around an electrical conductor selected from the group consisting of copper and aluminum and cured at an epoxide-catalyst temperature of at least 150° C.

4,356,418
ALTERNATOR COIL WINDING

Lebern W. Stroud, 3237 Gerome, Fort Worth, Tex. 76118

Filed May 27, 1980, Ser. No. 153,425
Int. Cl.³ H02K *3/00*
U.S. Cl. 310—184 5 Claims



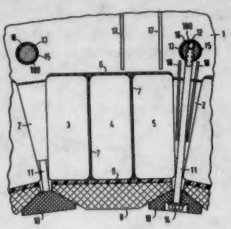
1. An alternator of the type having an annular stationary stator with a rotor concentrically located therein, comprising:
an annular structure formed of ferro-magnetic material defining an annular stator core having forty-two segments with adjacent segments being separated by a slot such that there are forty-two slots which extend in a direction parallel to the axis of said stator core, and
a three phase stator winding connected in a Y configuration, each phase comprising a winding having fourteen coils extending around said stator core on the inside thereof,
each of said coils of each phase winding comprising a plurality of turns of wire encircling three segments,
said fourteen coils of each phase winding having a plurality of turns located in fourteen of said slots such that said fourteen slots for each phase winding respectively has the following number of turns located therein, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5,
said fourteen coils of each phase winding respectively having the following number of turns at one edge of said winding located outside of said slots on one side of said core, 2, 2, 3, 2, 3, 2, 3, 2, 3, 2, 3, 2, 3, 2,
said fourteen coils of each phase winding respectively having the following number of turns at the other edge of said winding located outside of said slots on the other side of said core, 2, 3, 2, 3, 2, 3, 2, 3, 2, 3, 2, 3, 2, 3.

4,356,419
APPARATUS FOR FASTENING AN AIR GAP WINDING

Joachim Böer, and Heinrich Beermann, both of Mulheim an der Ruhr, Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim on der Ruhr, Fed. Rep. of Germany

Filed Jun. 13, 1980, Ser. No. 159,308
Claims priority, application Fed. Rep. of Germany, Jun. 20, 1979, 2924863
Int. Cl.³ H02K *1/06*
U.S. Cl. 310—217 7 Claims

1. Apparatus for fastening an air gap winding for electric machines having a large power rating, such as turbo generators, comprising a stator lamination stack formed of magnetic lamination segments, a mounting body formed of non-magnetic lamination segments having teeth with slots formed therebetween, said non-magnetic mounting body being integral with said magnetic stator lamination stack forming common homogeneous lamination segments by welding said teeth in the regions of the base lines thereof to said stator lamination stack segments in the circumferential direction, winding bars being held in said slots and extending beyond said teeth into the mechanical air gap, pressure strips disposed in longitudinal direction of said slots pretensioning said winding bars in radial

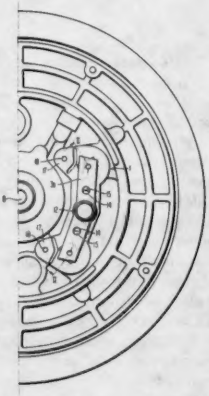


direction, clamping screws being radially disposed in the vicinity of said slot teeth and holding said pressure strips, and abutments anchoring said clamping screws in the vicinity of said stator lamination stack.

4,356,420
BRUSH HOLDER FOR ROTATING ELECTRICAL MACHINES

Dominique Mercuzot, Talant, France, assignor to CEM Compagnie Electro Mecanique, Paris, France

Filed Apr. 9, 1980, Ser. No. 138,722
Claims priority, application France, Apr. 11, 1979, 79 09178
Int. Cl.³ H02K *13/00*
U.S. Cl. 310—239 8 Claims



1. A brush holder for supporting an electrically conductive brush and a compression spring in an operative position on a rotating electrical machine, comprising:
a metallic sleeve having a longitudinal notch extending to one edge thereof;
an insulating support having a cavity in which the metallic sleeve is encased; and
a stop member projecting from said support into engagement with the notch in said sleeve, to thereby limit the longitudinal movement of said sleeve in one direction within said cavity.

4,356,421

PIEZOELECTRIC RESONATORS OF AN ENERGY-TRAPPING TYPE OF A WIDTH EXTENSIONAL VIBRATORY MODE

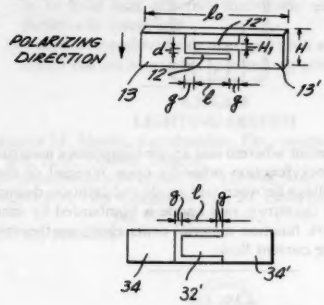
Hiroshi Shimizu, Sendai, and Hiroshi Watanabe, Izumi, both of Japan, assignors to Tohoku Metal Industries, Ltd., Miyagi, Japan

Filed Mar. 9, 1981, Ser. No. 241,738

Claims priority, application Japan, Mar. 25, 1980, 55-36960; Mar. 25, 1980, 55-36961

Int. Cl.³ H01L 41/08

U.S. Cl. 310—320 16 Claims



1. A piezoelectric resonator of an energy-trapping type of a width-extensional mode comprising:

a lengthy rectangular piezoelectric plate polarized in a direction perpendicular to the lengthwise direction thereof, said plate having a width determined by a predetermined resonance frequency;

at least one pair of first and second elongated excitation electrode means having a width narrower than said width of said plate and formed on a central portion of said piezoelectric plate to extend in the lengthwise direction of said plate in parallel with one another and apart from one another by a distance in said polarizing direction;

first peripheral electrode means formed on, and over the width of, one end portion of the surface of said piezoelectric plate on which said first excitation electrode means is formed, said first peripheral electrode means connected to a lead wire means;

first portion extended from said first excitation electrode means towards said first peripheral electrode means to connect therebetween;

second peripheral electrode means formed on, and over the width of, the other end portion of the surface of said piezoelectric plate on which said second excitation electrode means is formed, said second peripheral electrode connected to another lead wire; and

second portion extended from said second excitation electrode means towards said second peripheral electrode means to connect therewith.

4,356,422

ACOUSTIC TRANSDUCER

Gerardus A. van Maanen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

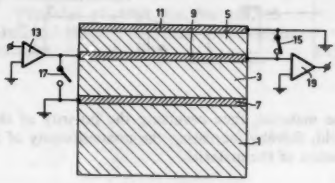
Filed Jun. 2, 1980, Ser. No. 155,698

Claims priority, application Netherlands, Jun. 25, 1979, 7904924

Int. Cl.³ H01L 41/10

U.S. Cl. 310—322 10 Claims

1. An acoustic transducer, comprising a transmitter including a plate of piezoelectric ceramic material having electrodes on opposite surfaces, one side of said plate being covered with an adaptation layer of a thickness approximately one quarter of the wave-length of sound at the resonance frequency of the plate, said adaptation layer comprising a receiver including a



layer of piezoelectric or ferroelectric polymer material having a pair of electrodes on opposite surfaces thereof.

4,356,423

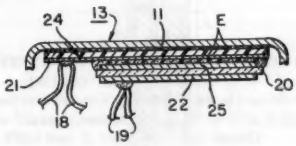
PRESSURE SENSITIVE INTRUSION SENSING LINE

Martin G. Gudzin, Dallas, Tex., assignor to Teledyne Industries, Inc., Geotech Division, Dallas, Tex.

Filed Nov. 28, 1980, Ser. No. 211,003

Int. Cl.³ H01L 41/04

U.S. Cl. 310—338 8 Claims



1. An intrusion sensing line to be buried below the surface of a medium and operative to deliver electrical signals in response to pressure changes in the medium resulting from intrusive stresses applied thereto, comprising:

(a) multiple sealed metal transducer shells respectively spaced apart along said sensing line and joined together by multiple lengths of flexible metal tubing, the lengths having ends which extend into and terminate within the shells, the tubing and shells being sealed together by metal-to-metal bonding, and each transducer shell having one flat face comprising a diaphragm which is flexible in response to said pressure changes;

(b) a transducer unit inside each shell comprising a thin insulating board having one side overlying and bonded to said diaphragm face and having a flat piezoceramic transducer member bonded to its other side, the member comprising a piezoceramic disc with first and second electrodes bonded to its faces, the insulating board and transducer member and electrodes being operative to flex with said diaphragm face of the shell; and

(c) two insulated wires extending through the lengths of tubing and the shells comprising the sensing line, and the wires being coupled respectively with the first and second electrodes in each shell.

4,356,424

PSEUDO-AC METHOD OF NONUNIFORMLY POLING A BODY OF POLYMERIC PIEZOELECTRIC MATERIAL AND FLEXURE ELEMENTS PRODUCED THEREBY

Michael A. Marcus, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

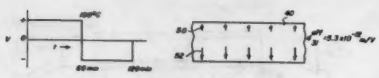
Filed Nov. 24, 1980, Ser. No. 209,801

Int. Cl.³ H01L 41/22

U.S. Cl. 310—357 11 Claims

1. A method of nonuniformly poling a body of polymeric piezoelectric material, comprising the steps of:

applying across a thickness of the body, an electric field of a strength sufficient to induce nonuniform polarization in



the material; then reversing the polarity of the applied field, thereby increasing the nonuniformity of the polarization of the material.

4,356,425

ELECTRODE FOR TUNING FORK TYPE QUARTZ CRYSTAL VIBRATOR

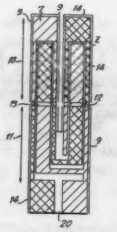
Shigeru Kogure; Eishi Momosaki, and Minoru Inoue, all of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Nagano, Japan

Filed Feb. 20, 1980, Ser. No. 122,870

Claims priority, application Japan, Feb. 20, 1979, 54-18857

Int. Cl.[3] H01L *41/08*

U.S. Cl. 310—370 12 Claims



1. A tuning fork type vibrator comprising:

a vibrator leaf having a base and a pair of arms extended therefrom to form a tuning fork;

at least a first electrode and a second electrode formed on portions of the surfaces of said vibrator leaf, said electrodes being electrically separate, said electrodes on the surfaces of said arms being divided by a gap at at least one position transversely across the length of said arms, edges of said first electrode on the face surfaces of said arms being substantially adjacent and opposed to edges on said arm face surfaces of said second electrode, each said electrode on a face of an arm covering a center portion of said arm face surface on one side of said gap and at least an edge portion on the other side of said gap, said portions of the same electrode being connected across said gap by a narrow bridge segment, when electrically driven, the electric fields of adjacent portions of said first and second electrodes across said gap are out of phase with each other.

4,356,426

THYRATRON HAVING ANODE WITH LOW WORK FUNCTION MATERIAL

Hugh Menown, Writtle, England, assignor to English Electric Valve Company Limited, Chelmsford, England

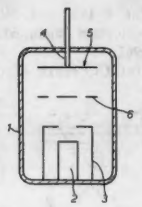
Filed May 14, 1980, Ser. No. 149,646

Claims priority, application United Kingdom, May 15, 1979, 7916814

Int. Cl.[3] H01J *17/10*

U.S. Cl. 313—193 4 Claims

1. In a thyratron including a sealed envelope; an electrode assembly positioned within said sealed envelope including a cathode located at one end thereof, an anode at the other end and a control grid interposed between said cathode and said anode; means for applying a positive voltage to said anode with respect to said cathode; and a gas contained within said envelope, said gas forming a plasma in response to the application of a voltage to said electrode assembly and acting as a carrier for current flowing between said anode and said cath-



ode; the improvement wherein said anode comprises a material having a low work function whereby upon reversal of the polarity of the voltage between said anode and cathode, during operation of said thyratron, said anode is bombarded by ions and said low work function material emits electrons thereby enhancing reverse current flow.

4,356,427

FLAT DISPLAY DEVICE

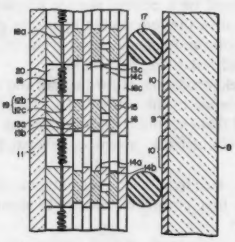
Mikio Noguchi, Chigasaki, and Kazuho Kobayashi, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 15, 1980, Ser. No. 178,283

Claims priority, application Japan, Aug. 16, 1979, 54/103576; Jun. 13, 1980, 55/78915

Int. Cl.[3] H01J *29/50*

U.S. Cl. 313—422 4 Claims



1. A flat display device comprising:

a vacuum envelope constituted by a back base plate and a flat display panel provided with an inner fluorescent material layer;

a thermionic cathode structure disposed on or near the inner side of said back base plate and extending parallel to said display panel;

a plurality of flat electrode structures stacked together with intervening insulators between said thermionic cathode structure and said fluorescent material layer and each having a plurality of thermionic electron beam passage holes;

said plurality of flat electrode structures being arranged such as to control and accelerate thermionic electron beams emitted from said thermionic cathode structure so as to cause said thermionic electron beams to impinge upon picture element regions predetermined in a regular arrangement on the surface of said fluorescent material layer;

said thermionic cathode structure including a plurality of coiled heaters each having an effective thermionic elec-

tron emitting portion constituted by a coating of a thermionic electron emitting material, each of said thermionic electron emitting portion being provided for each of said picture element regions;

said thermionic electron passage holes in said flat electrode structures being each provided at a position corresponding to each of said effective thermionic electron emitting portions;

said coiled heaters being supported in their predetermined portions other than said effective thermionic electron emitting portions by a plurality of support members such as to hold said effective thermionic electron emitting portions in space; and

said support members being arranged such as to connect said coiled heaters in parallel to a heating power source.

4,356,428

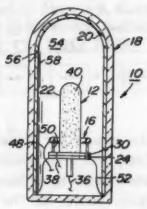
LIGHTING SYSTEM

Jacques M. Hanlet, Loxahatchee, Fla., assignor to Intent Patent, A.G., London, England

Continuation-in-part of Ser. No. 121,918, Mar. 5, 1980, Pat. No. 4,341,976. This application Jun. 20, 1980, Ser. No. 159,072

Int. Cl.³ H01J *61/42, 17/06*

U.S. Cl. 313—485 **73 Claims**



1. A lighting system comprising:

(a) cathode means for emitting electrons from an external surface thereof, said cathode means including a cathode sleeve member and a cathode base member hermetically sealed each to the other defining a cathode internal chamber, said cathode internal chamber having a cathode gas composition contained therein at a predetermined pressure;

(b) first anode means extending internal said cathode means for heating said cathode means thereby emitting said electrons from said external surface;

(c) second anode means positionally located external said cathode means for accelerating said electrons emitted from said cathode means external surface; and,

(d) a bulb member encompassing said cathode means, said first anode means and said second anode means in a substantially hermetic seal, said bulb member having a predetermined gas composition contained therein, said gas composition atoms being ionized by said cathode means emitted electrons, said gas composition ionized atoms radiating in the ultraviolet bandwidth of the electromagnetic spectrum, said bulb member being coated with a fluorescent material for intercepting ultraviolet energy responsive to said ionization of said gas composition atoms, said cathode sleeve member being a substantially cylindrically contoured member having a predetermined diameter, said sleeve member diameter and cathode gas composition pressure being maintained approximately in accordance with the formula:

$$2.0 > p \times d > 3.0$$

where:

p = predetermined gas composition pressure in mm. Hg.

d = predetermined diameter of sleeve member in cm.

4,356,429

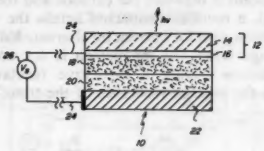
ORGANIC ELECTROLUMINESCENT CELL

Ching W. Tang, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 17, 1980, Ser. No. 169,705

Int. Cl.³ H01J *1/62;* **H01L** *29/28, 31/06*

U.S. Cl. 313—503 **5 Claims**



1. In an electroluminescent cell including an anode electrode, a cathode electrode, and a luminescent zone between said electrodes comprising an organic luminescent agent and a binder having a breakdown field strength of at least about 10^5 volt/cm,

the improvement comprising, between said luminescent zone and said anode electrode, a hole-injecting zone comprising a layer of a porphyrinic compound.

4,356,430

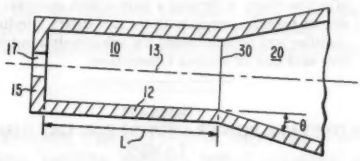
GYROTRON CAVITY RESONATOR WITH AN IMPROVED VALUE OF Q

David S. Stone, and James F. Shively, both of Los Altos, Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Sep. 5, 1980, Ser. No. 184,492

Int. Cl.³ H01J *25/00*

U.S. Cl. 315—4 **7 Claims**



1. A cavity resonator with a reduced Q value, said resonator having a longitudinal direction and an effective length along said direction, said resonator being connected to and directly opening into an output waveguide across a junction plane which is perpendicular to said direction, each segment of the inner wall of said output waveguide making an angle smaller than 20° with said direction, the Q value of said resonator being smaller than $8\pi(L/\lambda)^2$ where L is said effective length and λ is the free-space wavelength of the cavity resonance inside said resonator.

4,356,431

MAGNETRON ENERGIZING CIRCUIT

Albert E. Feinberg, Chicago, Ill., assignor to Advance Transformer Company, Chicago, Ill.

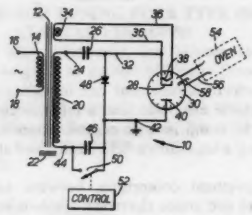
Filed Feb. 21, 1978, Ser. No. 879,261

Int. Cl.³ H05B *39/00, 41/14*

U.S. Cl. 315—101 **5 Claims**

1. In a magnetron energizing circuit for energizing a heating magnetron from an a.c. line of relatively low voltage and low frequency and which includes a magnetron having an anode and a cathode, the anode being connected to ground potential, a constant current transformer and condenser means combination which comprises (i) a step-up transformer having a pri-

mary winding connected to said a.c. line, (ii) a secondary winding isolated from said primary winding but coupled in high leakage reactance operating relation to said primary winding, said secondary winding having a high voltage end terminal and a low voltage end terminal, and (iii) condenser means connected in series with said secondary winding and to the high voltage end terminal thereof, the cathode of the magnetron being connected to said condenser means so that the condenser means is between the cathode and the high voltage end terminal, a rectifier connected across the magnetron to serve as a return path for current on alternate half cycles of the output voltage when the magnetron is not conducting, the condenser means having a capacitive reactance which is greater than the leakage reactance of the transformer so that



the secondary circuit of the transformer has leading current flowing therein at all times, the invention herein which comprises:

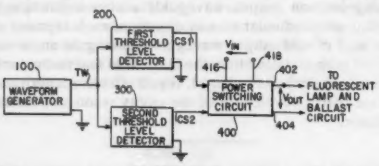
means providing alternative connections of the low voltage end of the secondary winding to the magnetron anode, comprising one connection being a conductive path directly to ground potential to enable the energizing circuit to furnish full power to the magnetron and the second connection comprising second condenser means and leads connecting same between said low voltage end and ground potential whereby when said second connection is effective there is formed a loop which contains both condenser means in series with the secondary winding and the rectifier and switch means for selectively rendering effective said one or second connection.

4,356,432

SOLID STATE POWER SWITCH FOR GAS DISCHARGE LAMPS

Edmond I. Vinarub, Cheshire, Conn., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Feb. 25, 1981, Ser. No. 238,143
Int. Cl.³ H05B *41/36*
U.S. Cl. 315—287 **8 Claims**



1. A power switching circuit for gas discharge lamps, comprising:

a source of a timing control signal of predetermined frequency;

first threshold detection means responsive to said timing control signal for generating a first control signal when said timing control signal crosses a first threshold level;

second threshold detection means responsive to said timing control signal for generating a second control signal when said timing control signal crosses a second threshold level;

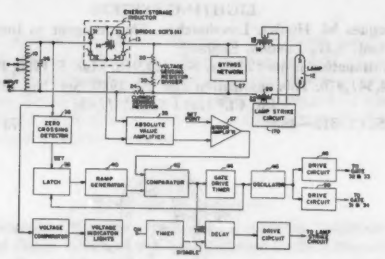
power switching means responsive to said first and second control signals, and including input terminals adapted for connection to a power source and output terminals adapted for connection to a gas discharge lamp circuit, for connecting said input terminals to said output terminals in a first polarity in response to said first control signal and in a reverse polarity in response to said second control signal.

4,356,433

HID LAMP POWER SUPPLY

Nicholas O. Linden, Cleveland, Ohio, assignor to The Nuarc Company, Inc., Chicago, Ill.

Filed Jul. 7, 1980, Ser. No. 166,159
Int. Cl.³ G05F *1/00*
U.S. Cl. 315—308 **25 Claims**



1. In a lamp strike circuit for initiating an arc in a high intensity discharge lamp, the combination of, a source of alternating current, means including at least a pair of controlled rectifiers for supplying power to the lamp from said AC source, a pair of pulse transformers each having a secondary winding one each of which is connected to one electrode of the lamp, a capacitor connected across the other end of said secondary windings, means for supplying lamp strike pulses to the primary windings, means for supplying lamp strike pulses to the primary windings of the said pulse transformers so that high voltage pulses are developed across said secondary windings which cause the formation of an arc within the lamp, said capacitor shunting the ends of said secondary windings to prevent said high voltage pulses from reaching said controlled rectifiers, and said capacitor also being charged from said source when said controlled rectifiers are conducting and an arc has not been initiated in said lamp, and resistive means for discharging said capacitor between conduction periods of said controlled rectifiers to prevent voltage build-up on said capacitor during successive half cycles of said alternating current source.

4,356,434

MULTIPLE COLOR SINGLE GUN TV PICTURE TUBE

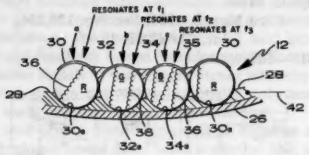
Keith T. Bleuer, 1663 Wilshire Dr. NE., Rochester, Minn. 55901

Continuation-in-part of Ser. No. 222,774, Jan. 6, 1981, which is a continuation-in-part of Ser. No. 186,234, Sep. 11, 1980, abandoned. This application Mar. 12, 1981, Ser. No. 242,976
Int. Cl.³ H01J *29/80*
U.S. Cl. 315—375 **18 Claims**

1. A cathode ray tube comprising an evacuated envelope having a light transmitting picture viewing face, an electron gun in said envelope positioned to direct electrons to said viewing face, and an electron responsive coating on the inside surface of said face;

said coating comprising sets of first, second and third circuits tuned to resonate at different frequencies of electron flow from said gun; and sets of first, second and third fluorescent

bodies associated respectively with said first, second and third circuits and respectively providing different colors of

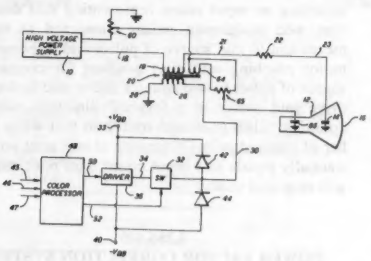


illumination viewable through said face as said different frequencies of electron flow are applied to these circuits.

4,356,435
RANDOM COLOR SWITCH FOR BEAM PENETRATION CRT

Michael H. Kalmanash, Fairfield, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 1, 1981, Ser. No. 259,342
Int. Cl.³ H01J *29/80*
U.S. Cl. 315—375 **6 Claims**



1. A high voltage color switch for a beam penetration cathode-ray tube in which a baseline color is normally displayed but can be switched for a color write period to a randomly selected color, comprising:

high voltage power supply means connectable to said cathode-ray tube and having an output voltage level selected to provide said baseline color when presented to said cathode-ray tube;

transformer means connected between the output of said high voltage power supply means and said beam penetration cathode-ray tube;

driver means for amplifying an input waveform identifying a randomly selected color to be displayed in a color write period, said driver means including a low voltage power supply;

switch means having an open position and a closed position connected between the output of said driver means and said transformer means;

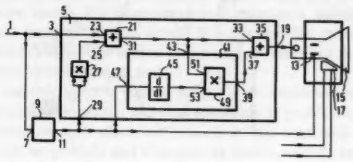
diode means connected between said transformer means and said low voltage power supply of said driver means; and

whereby at the end of said color write period during which a randomly selected color is displayed by said cathode-ray tube, said switch means is transitioned to its open position for a predetermined period of time allowing energy stored in said transformer means to be returned through said diode means to said low voltage power supply of said driver means.

4,356,436
PICTURE DISPLAY DEVICE

Piet G. J. Barten, and Johannes J. Bos, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 10, 1980, Ser. No. 185,821
Claims priority, application Netherlands, Sep. 13, 1979, 7906832
Int. Cl.³ H01J *29/52*
U.S. Cl. 315—386 **7 Claims**



1. A picture display device for displaying a video signal on a picture screen of an electron beam type picture display tube to be scanned by means of a deflection circuit, comprising a deflection correction signal generating circuit for obtaining a deflection correction signal from a video signal to be displayed and a signal processing circuit having a brightness correction signal generating circuit for adding to the video signal to be displayed a brightness correction signal which is influenced by a signal which is predominantly proportional to a first derivative with respect to time of the deflection correction signal, to correct for brightness deviation caused by changes in the scanning velocity in response to the deflection correction signals, wherein said brightness correction signal generating circuit comprises a multiplier to which the video signal and a signal which is predominantly proportional to the first derivative with respect to time of the deflection correction signal is applied, so that the brightness correction signal is predominantly proportional to a product of the video signal and the first derivative with respect to time of the deflection correction signal.

4,356,437
CONTROL CIRCUIT FOR DC MOTORS

Tadashi Saito; Toshihiko Nakajima, both of Yokohama, and Toshio Osada, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 17, 1980, Ser. No. 169,795
Claims priority, application Japan, Jul. 20, 1979, 54/91572; Jul. 20, 1979, 54/91573; Jul. 20, 1979, 54/91574; Sep. 7, 1979, 54/114202
Int. Cl.³ A02K *29/02*
U.S. Cl. 318—254 **15 Claims**

1. A DC brushless motor comprising:

(a) a rotor with a magnet,

(b) drive stator coils of at least three phases connected in star connection for driving the rotation of said rotor magnet,

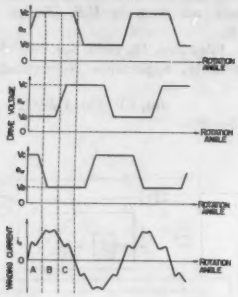
(c) a power drive circuit associated with each of the phases for energizing said drive coil in response to a drive signal,

(d) position sensor means associated with each of the phases for detecting the position of said rotor and producing a position signal,

(e) limit voltage setting means for producing first and second limit voltages, and

(f) a drive signal generating circuit provided between said position sensor means and said power drive circuit for each of the phases, including means for generating a drive signal of a substantially-trapezoidal voltage waveform and supplying the same to said power drive circuit, said substantially-trapezoidal waveforms for the respective phases having their upper and lower amplitudes determined by said first and second limit voltages from the limit voltage

setting means and being shifted by regular phases with one another and having inclinations with respect to the rotation angle of the rotor as determined by said position signal forming the changeover portions between the upper and lower limit amplitudes.

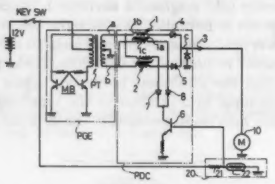


4,356,438

MOTOR SPEED CONTROL SYSTEM

Shinichiro Iwasaki, Auburn Heights, Mich., assignor to Aisin Seiki Company Limited, Kariya, Japan

Filed Aug. 29, 1980, Ser. No. 182,676
Int. Cl.³ H02P 5/18
U.S. Cl. 318—344 **8 Claims**



1. A motor speed control system for driving a control winding of a motor, comprising:

a motor including a control winding;

control means for generating a control voltage in correspondence with a desired speed of said motor;

a pulse duty controlling element including a core made of an amorphous magnetically soft material, a first electrical coil and a second electrical coil wound on said core, said first electrical coil including a first terminal coupled to said control winding to energize said control winding;

pulse generator means for applying a pulse signal to a second terminal of said first electrical coil to saturate said core magnetically;

reset means for applying a reset signal to a first terminal of said second electrical coil;

current controlling means coupled to a second terminal of said second electrical coil and to said control voltage for generating a reset current passing through said second electrical coil in accordance with said control voltage; and

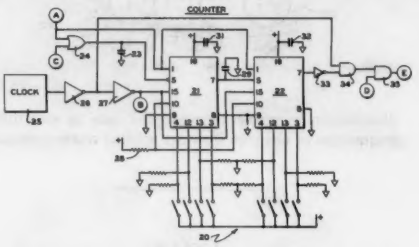
wherein said reset current resets the level of magnetic flux in said core to a level in dependence on said control voltage, whereby the time until saturation of said core after application of said pulse signal to said first coil is controlled to produce at said first terminal a pulse width controlled control winding energization signal for directly energizing said control winding in relation to said control signal.

4,356,439

STEPPER MOTOR CONTROL

Richard C. Mott, Harwood Heights, and Louis S. Smulkstys, Arlington Heights, both of Ill., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 3, 1980, Ser. No. 126,234
Int. Cl.³ G05B 19/40
U.S. Cl. 318—685 **28 Claims**



1. A control system for controlling a motor to a motor means having a motor;

a source of pulses;

initiate means connected to said motor means for connecting said source of pulses to said motor means to drive said motor in a reverse direction to a start position; and,

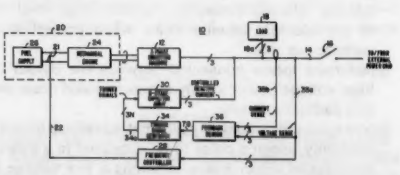
positioning means including a counter having an input for receiving an input count representing said desired position, said positioning means connected to said motor means and to said source of pulses and responsive to said motor reaching said start position for connecting said source of pulses to said counter and to said motor means to drive said motor in a forward direction, said counter counting pulses from said source so that when said number of counted pulses beginning at said start position substantially equals said input count, said positioning means will stop said motor.

4,356,440

POWER FACTOR CORRECTION SYSTEM

William P. Curtiss, Winthrop, and William C. Colley, III, Boston, both of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Sep. 18, 1980, Ser. No. 188,305
Int. Cl.³ G05F 1/70
U.S. Cl. 323—210 **9 Claims**



1. A power factor correction system for an n-phase power distribution system which provides power on at least n power lines, wherein each power line is coupled to an associated terminal, comprising:

A. an N-stage switched capacitor array, where N is an integer, each stage including n capacitor networks, each network being associated with a pair of said n power lines, wherein the capacitor networks within each stage are each characterized by a predetermined capacitance for that stage, and wherein each capacitor network includes an associated capacitor switch means, each switch means being responsive to a trigger signal for selectively cou-

pling said capacitor network across its associated pair of power lines,

B. feedback means coupled to said power lines and including trigger means for generating said trigger signals,

wherein said feedback means includes power factor correction means for generating power factor signals representative of the power factors at the respective ones of said terminals, and wherein said feedback means includes means for coupling said power factor signals to said trigger means whereby said power distribution system delivers substantially only real power to external loads coupled to said terminals, and

wherein said power distribution system includes n+1 power lines, one of said power lines being a neutral line, and wherein said power factor correction means includes means for generating said power factor (PF) signals for each line-to-neutral pair by integrating, over a 360 degree interval, the product of the line-to-neutral voltage at the respective terminals and the integral of the a.c. component of the corresponding line current for the line.

4,356,441

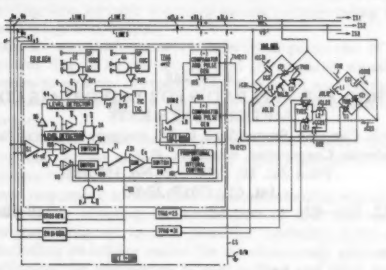
VOLTAGE REGULATOR UTILIZING A STATIC VAR GENERATOR WITH HALF PERIOD AVERAGING AND SATURATING TYPE FIRING ANGLE CONTROL

Thomas H. Putman; Laszlo Gyugyi, both of Penn Hills, and Michael B. Brennen, Wilkins Township, Allegheny County, all of Pa., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Jun. 30, 1977, Ser. No. 811,796

Int. Cl.³ H02J 3/18

U.S. Cl. 323—210 **11 Claims**



1. A voltage regulator for an alternating current electrical distribution system which supplies electrical power to a pair of terminals, wherein said distribution system has an apparent impedance disposed in series circuit relationship with one of said terminals, said impedance affecting the voltage at said terminals as a function of the amount of current flowing through said impedance comprising:

(a) reference means for fixing a reference voltage for said terminals;

(b) determining means for measuring the actual voltage at said terminals and providing an output signal indicative of the positive and negative half cycles of said actual voltage, first comparator means for providing a positive first comparator output control signal for positive half cycles of said actual voltage and a negative first comparator output control signal for negative half cycles of said actual voltage, a second comparator means for providing a positive second comparator output control signal which is ninety degrees phase shifted from said positive first comparator output control signal and for providing a negative second comparator output control signal which is ninety degrees phase shifted from said negative first comparator output control signal, integrator means interconnected with the output of said determining means and having a control terminal interconnected with said first and second comparator means for integrating said actual voltage when said positive first comparator output control signal is present and for holding an integration signal representative of said integration only during a condition when said negative first comparator output control signal and said positive second comparator output control signal are concurrently present, track and store means interconnected with the output of said integrator means for tracking said integration means output signal during the time of said condition, and at a time thereafter providing as an output a signal related to the integral of said actual voltage;

(c) third comparator means including summing means interconnected with said reference means and said track and store means for comparing said reference voltage with said integral of said actual voltage and for providing a third comparator means output signal related to the difference therebetween; and

(d) reactive current source means interconnected with said comparator means and said terminals to provide compensating reactive electrical current to said terminals of sufficient magnitude and direction as determined by said comparator means output signal to change the amount of said current flowing through said impedance to a value which causes said difference between said actual voltage and said reference voltage to be generally zero.

4,356,442

ELECTRONIC VOLTAGE AND CONTINUITY TESTING UNIT

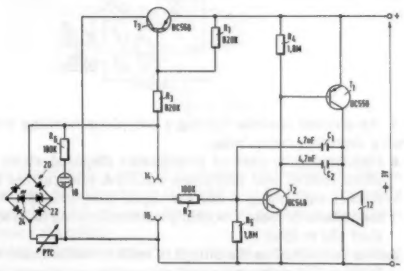
Christian Beha, Föhrentalstrasse 6, 7804 Glottertal, Fed. Rep. of Germany

Filed Apr. 15, 1980, Ser. No. 140,476

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1979, 2915530

Int. Cl.³ G01R 19/14, 31/02, 15/12

U.S. Cl. 324—51 **10 Claims**



1. Testing apparatus having the capability of effecting a single voltage pole mode of testing and of effecting a continuity mode of testing, said apparatus comprising:

(a) first and second testing terminals;

(b) a loudspeaker;

(c) a battery energized oscillator circuit coupled to energize said loudspeaker and having a control input, said second testing terminal being coupled to said oscillator circuit;

(d) a control transistor having a base, an emitter and a collector;

(e) first and second resistances, said first resistance being connected in circuit between said base and said emitter of said control transistor, the battery being connected through said emitter and collector of said control transistor to said control input of said oscillator circuit, said first testing terminal being connected through said second resistor to apply an AC voltage component to said base of said control transistor;

(f) said first and second resistances being valued such that when a test alternating voltage component is applied solely to said first testing terminal, a sufficient voltage

appears upon said first resistance for the control of said control transistor;

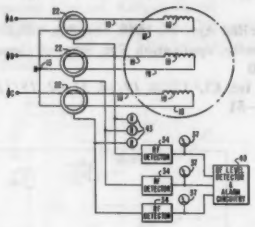
(g) said oscillator circuit operative in a continuity mode upon the ohmic connection of said first and second testing terminals, whereby a voltage is applied to said base rendering said control transistor conductive and applying an enable signal to said control input to render said oscillator circuit into an oscillating state thereby producing an oscillator output signal energizing said loudspeaker, and operative in a single pole voltage mode, whereby an alternating voltage component as applied solely to said first testing terminal is imposed across said first and second resistances to render conductive said control transistor and to apply an enable signal through said conductive control transistor to said control input to render said oscillator circuit to its oscillating state, thereby producing an oscillator output signal modulated by the frequency of said alternating voltage component energizing said loudspeaker.

4,356,443

DETECTION OF ARCING FAULTS IN POLYPHASE ELECTRIC MACHINES

Franklin T. Emery, Greentree, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 26, 1980, Ser. No. 181,513
Int. Cl.³ G01R *31/02*
U.S. Cl. 324—51 **11 Claims**



1. An electric machine having a polyphase winding with an arcing detector, comprising:

a high-frequency current transformer disposed about each phase lead of said polyphase machine, said current transformer outputting a current signal proportionate to the magnitude of radio frequency current flowing in its associated phase lead;

means connected to the output of each of said current transformers for converting said proportionate current signal to a direct-current voltage value; and

means for individually measuring the magnitude of said direct-current voltage value for each phase winding of said polyphase electric machine.

4,356,444

TEST SYSTEM FOR CATHODIC PROTECTION CIRCUIT OF AN UNDERGROUND PIPELINE

Alfredo Saenz, Jr., 18643 Chestnut Ave., Country Club Hills, Ill. 60477

Filed Dec. 15, 1980, Ser. No. 216,385
Int. Cl.³ G01R *34/12*
U.S. Cl. 324—54 **11 Claims**

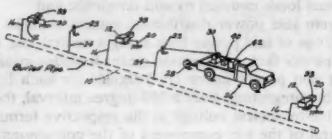
1. An apparatus for testing the pipe-to-soil potential of a buried pipeline having a plurality of rectifiers electrically connected to it at spaced apart intervals for applying an electrical potential to said pipe, comprising

a plurality of synchronous rectifier current interrupters, each interrupter adapted for electrical connection to a respective one of said rectifiers for turning said rectifier on and off at intervals,

a clock reference unit electrically connectable to each of said interrupters for synchronizing each interrupter with the reference unit whereby, upon synchronization of all said interrupters, all of said rectifiers are turned on and off in unison,

a portable sensing device operative for producing signals indicative of the pipe-to-soil potential of a pipe,

a synchronous ON/OFF pipe-to-soil potential demultiplexer, said demultiplexer being electrically connected to



said recording device for electronically separating the on and off potentials,

said clock reference unit being electrically connectable to said demultiplexer for synchronizing said demultiplexer with the reference unit and interrupters whereby said demultiplexer will operatively separate signals indicative of the ON and OFF potentials respectively, and

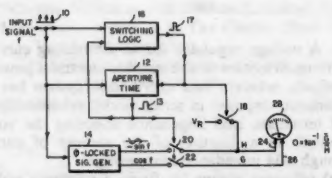
means for separately recording said separated signals.

4,356,445

METHOD AND APPARATUS FOR DRIVING AIR CORE METER MOVEMENTS

James S. Congdon, Santa Clara, Calif., assignor to Cherry Semiconductor Corporation, Cranston, R.I.

Filed Jul. 10, 1980, Ser. No. 168,372
Int. Cl.³ G01R *23/00*
U.S. Cl. 324—82 **19 Claims**



1. Circuitry for providing, in response to a periodic input signal of variable frequency, first and second output signals suitable for driving an air core meter means to provide a meter deflection indicative of the frequency of the input signal, comprising:

means, responsive to the input signal, for providing first and second signals which are respectively representative of cosine and negative sine waveforms, and which have a predetermined phase relationship with the input signal;

means, responsive to the input signals, for providing a pulse signal having a duration which is determined by the period of the input signal;

means for applying a reference signal to the meter for the duration of the pulse signal;

means for defining an aperture interval following the end of said pulse signal; and

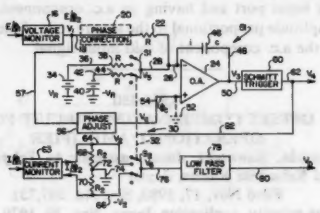
means for applying the first and second waveforms to the meter during the aperture interval.

4,356,446

TIME DIVISION MULTIPLIER TRANSDUCER WITH SELECTIVE PHASE SHIFT

Frank E. Battocletti, Columbus, Ohio, assignor to TransData, Inc., Dublin, Ohio

Filed Mar. 23, 1981, Ser. No. 246,848
Int. Cl.³ G01R 25/00
U.S. Cl. 324—83 R 17 Claims



1. A power transducer for monitoring a power line exhibiting given power and phase characteristics, comprising:

means for monitoring a first electrical parameter of said power line to derive a first scaled signal corresponding therewith and exhibiting a phase deviating from said given phase by a first error angle;

integrator stage means, including an amplifier having inverting and non-inverting inputs, for providing an integrated output;

trigger means responsive to said integrated output for providing time variable actuating signals corresponding with said integrated output;

means for monitoring a second electrical parameter of said power line to derive second and third scaled signals of opposite polarity corresponding therewith and exhibiting a phase deviating from said given phase by a second error angle;

low pass filter means having an input for selectively receiving and second and third scaled signals and providing a power responsive output;

means responsive to said time variable actuating signals for alternately effecting the application of first and second reference signals to said amplifier inverting input and, including switching means for simultaneously alternately effecting the application of said second and third scaled signals to said low pass filter means input;

phase adjust means responsive to said first scaled signal for providing a predetermined phase related signal at said amplifier non-inverting input to effect a selected phase relationship of said filter power responsive output with respect to said given phase characteristic.

4,356,447

SYSTEM AND APPARATUS TO DETERMINE THE ANGULAR POSITION, AND SPEED OF A ROTATING SHAFT, PARTICULARLY CRANK SHAFT OF AN INTERNAL COMBUSTION ENGINE

Günter Hönig, Ludwigsburg; Uwe Kiencke, Ditzingen, and Rainer Bone, Vaihingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 10, 1980, Ser. No. 168,210
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1979, 2933516
Int. Cl.³ G01P 3/48, 3/54
U.S. Cl. 324—169 9 Claims

1. Sensing system to determine angular position of a rotary shaft (W) having

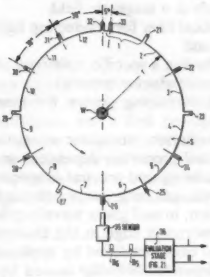
a disk element (S,S') rotating with a shaft, the disk element being subdivided into a plurality of successive zones of equal radial distance (r) from the center of the disk, and separated from each other by a plurality of circumferentially positioned angle position marker elements (21–32; 41–47) separating said zones, which angle marker elements are narrow with respect to the circumferential extent of the zones and which are formed with abrupt flanks to result in sharp change of a physical parameter upon rotation of the disk past a fixed pick-up sensor (35) and comprising, in accordance with the invention

an additional marker element (33) forming a reference marker located in at least one of the zones and between two angle position marker elements, the angular distance of said additional reference marker element to a first angle position neighboring marker element (21) at one side of said reference marker element being substantially larger than the angular distance to a second neighboring marker element (32) at the opposite side of said reference marker element (33);

a fixed sensor (35) positioned in sensing relation to said disk element and sensing passing both the angle position marker element and the additional reference elements past the sensor upon rotation of the shaft and providing needle-pulse type output signals;

two counters (Z_1, Z_{12}, Z_{1n}; Z2) connected to and controlled by the sensor to start counting upon receipt of an output signal from the sensor;

means generating a first frequency (f_1), said first frequency being applied to the first counter as a counting clock frequency therefor;



means generating a second frequency (f_2) which is higher than said first frequency (f_1), said second frequency being applied to the second counter as a counting clock frequency therefor;

a memory (Sp) connected to the first counter (Z_1), Z_{12}, Z_{1n}) and receiving the count state thereof which said first counter has reached in the period of time from a preceding output signal;

a comparator (V) connected to the memory (Sp) and to said second counter (Z_2) and comparing whether the count state of the second counter, counting at the higher frequency, has a value which is greater, or less than the value stored in the memory;

and a transfer switch, operated by the comparator to route the signal from the sensor (35)

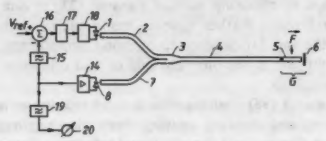
(a) to a first output line (39) indicative of a marker pulse if the comparator determines that the count state of the second counter, (Z_2) upon termination of its counting period due to occurrence of a subsequent output signal from the sensor, has not reached the count state stored in the memory based on the preceding stored count state derived from the first lower frequency counter; and,

(b) to a second output line (40) if the count state of the second counter (Z2) reaches the count state stored in the memory (S_p) based on the preceding stored count state derived from the first, lower frequency counter.

4,356,448
APPARATUS FOR MEASURING ELECTRICAL OR MAGNETIC FIELDS BY ABSORPTION SPECTRUM CHANGE

Torgny Brogardh, and Olof Enestrom, both of Västeras, Sweden, assignors to ASEA Aktiebolag, Västeras, Sweden

Filed May 23, 1980, Ser. No. 152,724
Claims priority, application Sweden, May 31, 1979, 7904752
Int. Cl.³ G01R 31/00, 33/02
U.S. Cl. 324—244 25 Claims



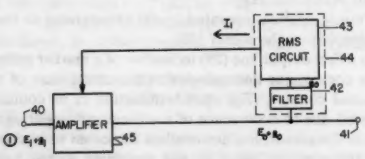
1. An optical measuring device for measuring magnetic fields, comprising:
at least one radiation modulator consisting of a material having spectral properties dependent on said field;
means for measuring said spectral properties by radiation in a given wavelength range passing through said modulator, said modulator, in said given wavelength range, having at least one absorption edge in the absorption sprectrum of said material being modified by application of said field, said field dependence being caused by changes in the Landau levels in a magnetic field;
at least one optical fiber for conducting light to and from the modulator; and
said material having a specific resistivity at least as great as that of a semiconductor material.

2. An optical measuring device for measuring electrical fields, comprising:
at least one radiation modulator consisting of a material having spectral properties dependent on said field;
means for measuring said spectral properties by radiation in a given wavelength range passing through said modulator, said modulator, in said given wavelength range, having at least one absorption edge in the absorption spectrum of said material being modified by application of said field, said field dependence being caused by changes in the Franz-Keldysh effect of an electric field;
at least one optical fiber for conducting light to and from the modulator; and
said material having a specific resistivity at least as great as that of a semiconductor material.

4,356,449
LOGARITHMIC ATTENUATING CIRCUIT

Paul L. Thomas, Loveland, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 31, 1980, Ser. No. 135,952
Int. Cl.³ G06G 7/24
U.S. Cl. 328—145 9 Claims

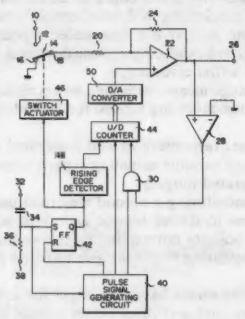


1. A logarithmic attenuating circuit comprising:
an input port for receiving an input signal;
an output port;
an a.c. amplitude detector having an input connected to said output port and an output for providing an amplitude signal proportional to the amplitude of the a.c. component of an output signal present at said output port; and
an amplifier having an input connected to said input port and an output connected to said output port, said amplifier being responsive to said amplitude signal for producing a gain which is inversely proportional to the amplitude of said amplitude signal, to provide at said output port an output signal having the same shape as the input signal at the input port and having an a.c. component having an amplitude proportional to the square root of the amplitude of the a.c. component of said input signal.

4,356,450
OFFSET COMPENSATING CIRCUIT FOR OPERATIONAL AMPLIFIER

Eiji Masuda, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Nov. 17, 1980, Ser. No. 207,731
Claims priority, application Japan, Nov. 29, 1979, 54-154592
Int. Cl.³ H03F 1/02, 3/45
U.S. Cl. 330—9 10 Claims



1. An offset compensating circuit for an operational amplifier having two input terminals comprising:
a reference voltage terminal connectable to a first input terminal;
comparing means connected to the output terminal of said operational amplifier and to said reference voltage terminal for comparing signal levels at both said terminals and generating a two-level signal indicating the result of said comparison;
counting means connected to said comparing means for generating a digital count at an output terminal in response to the state of said two-level signal; and
a digital-to-analog converter having an input terminal connected to the output terminal of said counting means and and having an output terminal connected to a second input terminal of said operational amplifier to supply said operational amplifier with an analog signal corresponding to said count to compensate for voltage offset in said operational amplifier.

4,356,451
ACTIVE BAND PASS FILTER

Harold E. Wilson, PSC Box 253, APO, Miami, Fla. 34002

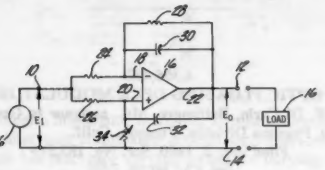
Filed Jun. 16, 1980, Ser. No. 159,805
Int. Cl.³ H03F 1/34
U.S. Cl. 330—107 7 Claims

1. An active band pass filter comprising:
an input terminal, an output terminal and a common terminal,
a differential amplifier having an inverting input and a noninverting input,

means for electrically connecting said input terminal to both said inverting and noninverting inputs,

frequency dependent feedback means for electrically connecting the output terminal to both said inverting and noninverting inputs so that said amplifier attains a predetermined gain at a resonant frequency and a lesser gain at other frequencies,

wherein said feedback means comprises a first capacitor electrically connected between said output terminal and said inverting input and a second capacitor electrically connected between said output terminal and said noninverting input and



wherein only said noninverting input of said differential amplifier is connected to said common terminal through a resistor, and

wherein the resonant frequency of the amplifier varies in accordance with the value of said resistor.

4,356,452

CLASS A PUSH-PULL AMPLIFIER WITH BIAS CONTROLLING CIRCUIT

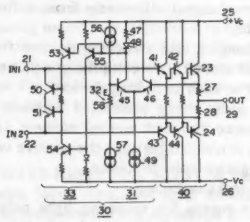
Masayuki Iwamatsu, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Aug. 26, 1980, Ser. No. 181,619

Claims priority, application Japan, Sep. 6, 1979, 54-114663; Sep. 6, 1979, 54-114664

Int. Cl.³ H03F *3/30*

U.S. Cl. 330—265 **13 Claims**



1. A class A push-pull amplifier comprising:

a first input terminal and a second input terminal to which an input signal to be amplified is applied in same phase;

an output terminal for delivering said input signal amplified to a load;

first amplification means and second amplification means for push-pull operation, each amplification means having an input point and an output point and including at least one transistor, the input point of said first amplification means being connected to said first input terminal and the input point of said second amplification means being connected to said second input terminal;

first current detection means and second current detection means for detecting respectively each value of output currents delivered from the output points of said first and second amplification means, each current detection means being connected to each other in series between the output points of said first and second amplification means, and a junction point of said first and second current detection means being connected to said output terminal;

means for detecting a potential difference developed between said first and second current detection means to produce a control signal; and

bias setting means for feeding bias currents to the input points of said first and second amplification means in response to said control signal, whereby the sum of each output current delivered from the output points of said first and second amplification means is held constant.

4,356,453

REDUCED NOISE-IMPROVED GAIN TRANSISTOR CIRCUIT

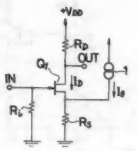
Susumu Sueyoshi, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Feb. 1, 1980, Ser. No. 117,590

Claims priority, application Japan, Feb. 8, 1979, 54-13787

Int. Cl.³ H03F *3/16*

U.S. Cl. 330—277 **7 Claims**



1. The transistor circuit comprising: a grounded-source type field-effect transistor; a source resistor coupled between the source of said transistor and a first potential; an adjustable constant current source coupled to supply a predetermined current other than a drain current to said source resistor; and a drain resistor coupled between the drain of said transistor and a second potential, an output from said circuit being taken from said drain.

4,356,454

EQUALIZER AMPLIFIER

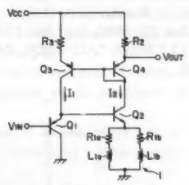
Susumu Sueyoshi, and Kikuo Ishikawa, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 17, 1980, Ser. No. 187,892

Claims priority, application Japan, Sep. 21, 1979, 54/121650

Int. Cl.³ H03F *3/04, 3/191;* H03H *5/00*

U.S. Cl. 330—294 **8 Claims**



1. An equalizer amplifier comprising:

a first transistor to the base of which an input signal is applied;

a second transistor to the base of which an output of said first transistor is applied, said second transistor being of the opposite conductivity type to said first transistor;

current supplying means for supplying currents to said first and second transistors with the ratio of said currents being constant;

output providing means for providing an output in response

to variations of current which flows in one of said first and second transistors; and

a plurality impedance elements for determining an amplification factor of said amplifier provided in the path of current flowing in at least one of said first and second transistor, at least one of said impedance elements having a reactance component which varies depending on frequency.

4,356,455

AMPLIFIER

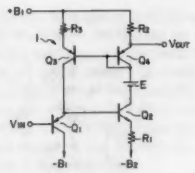
Akio Ozawa; Susumu Sueyoshi; Keishi Saito; Kikuo Ishikawa; Kiyomi Yatsuhashi; Satoshi Ishii, and Masamichi Yumino, all of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 17, 1980, Ser. No. 187,891

Claims priority, application Japan, Sep. 21, 1979, 54-121647

Int. Cl.³ H03F *3/04*

U.S. Cl. 330—296 **6 Claims**



1. An amplifier circuit comprising:

a first transistor to the base of which an input signal is applied;

a second transistor of an opposite conductivity type to said first transistor and to the base of which an output of said first transistor is applied;

means for supplying currents to said first and second transistors in such a manner that the ratio of said current supplied to said first transistor to said current supplied to said second transistor is a predetermined constant value; and

bias generating means for providing bias voltage to said first and second transistors so that the ratio of a collector-emitter voltage of said first transistor to a collector-emitter voltage of said second transistor is the reciprocal of said constant value so as to provide an output in response to variations of current in said first or second transistor.

4,356,456

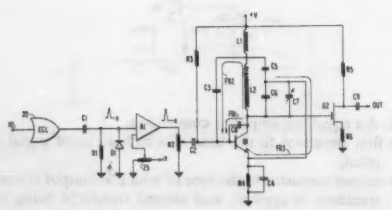
DIVISION BY NONINTEGER NUMBERS USING SYNCHRONOUS OSCILLATORS

Vasil Uzunoglu, Ellicott City, Md., assignor to Communications Satellite Corporation, Washington, D.C.

Filed Jul. 22, 1980, Ser. No. 171,074

Int. Cl.³ H03B *5/12*; H03L *7/00*

U.S. Cl. 331—117 R **25 Claims**



24. A method for dividing the frequency of an input signal by a non-integer number X/Y, X and Y being integers, to provide an output signal, the method comprising:

applying said input signal to synchronous oscillator means; and

synchronizing every Yth cycle of the output signal of said synchronous oscillator means with every Xth cycle of said input signal, thereby effectively simultaneously multiplying the frequency of said input signal by Y and dividing the frequency of said input signal by X at said synchronous oscillator means to produce said output signal.

4,356,457

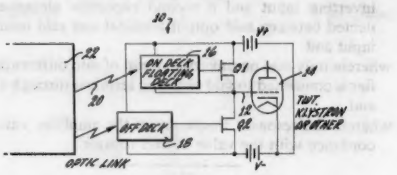
OPTIC FLOATING DECK MODULATOR

Edward F. Di Carlo, Baltimore, Md., assignor to General Dynamics, Pomona Division, Pomona, Calif.

Filed Sep. 2, 1980, Ser. No. 183,519

Int. Cl.³ H03K *7/08*

U.S. Cl. 332—3 **8 Claims**



1. An optic floating deck modulator for modulating a control element of an electron device in response to light pulses as information signals sent from a light source, said electron device having positive and negative DC voltage sources for operating said electron device, comprising:

a pair of high power switching devices connected in series between said positive and negative voltage sources,

the control element of said electron device being coupled between said switching devices to receive a positive voltage pulse and a negative voltage pulse as said switching devices are changed alternately from a first state to a second state,

means for changing said switching devices from said first state to said second state comprising a pair of decks connected one to each switching device,

one of said decks being connected between the positive voltage source and said control element and the other deck being connected between the positive voltage source and the negative voltage source,

each of said decks including,

light sensitive means for receiving light pulses from said light source and producing an electrical variation in response thereto, and

means for amplifying said electrical variation and applying same to the high power switching device to which it is connected.

8. An optic amplifier for driving an electron device in response to light pulses as information signals sent from a light source, comprising:

a positive DC voltage source,

a light sensitive device for receiving light pulses from said light source and producing an electrical variation in response thereto, and

means for amplifying said electrical variation and applying same to the electron device to which it is connected,

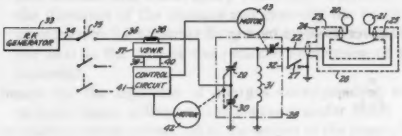
said means for amplifying said electrical variations comprises a trans-impedance amplifier, a transistor amplifier, and a FET amplifier, said amplifiers being connected in series, with said FET amplifier being connected between said positive voltage source and ground.

4,356,458

AUTOMATIC IMPEDANCE MATCHING APPARATUS

David Armitage, Bangor, England, assignor to Harry H. Leveen, Charleston, S.C.

Filed Aug. 31, 1981, Ser. No. 297,725
Int. Cl.³ H03H *7/40*
U.S. Cl. 333—17 M **10 Claims**



1. Automatic impedance matching apparatus comprising:

a matching unit comprising at least two reactors each of which has reactance varying means for varying the reactance thereof;

standing wave means for detecting and providing output signals corresponding respectively to the forward wave and to the reflected wave on a transmission line connected to said matching unit;

converting means connected to said standing wave means for converting said signals into digital output corresponding to the ratio of the reflected wave to the forward wave;

a pair of stepping motors, one motor being connected to the varying means of one of said reactors for controlling the reactance of the latter and the other motor being connected to the varying means of the other of said reactors for varying the reactance of the latter; and

control means connected to said motors for selecting a motor to be stepped and for stepping the selected motor in a direction which will change the impedance of said matching unit to a desired value, said control means comprising:

comparing means connected to said converting means for comparing the digital output obtained before stepping of a motor with the digital output obtained after the stepping of a motor and for providing an output signal; and

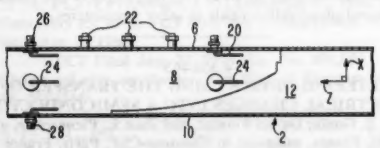
selection means connected to said motors and to said comparing means and responsive to said last-mentioned output signal to select a motor to be stepped and for stepping the selected motor in the direction which will change the reactance of the reactor connected to the selected motor to a desired value.

4,356,459

FLAT PHASE RESPONSE SEPTUM POLARIZER

Harry J. Gould, Mesa, Ariz., and Keiji Kawaguchi, Mountain View, Calif., assignors to Ford Aerospace & Communications Corp., Detroit, Mich.

Filed Mar. 23, 1981, Ser. No. 246,461
Int. Cl.³ H01P *1/16*
U.S. Cl. 333—21 A **8 Claims**



1. A septum polarizer for converting linearly polarized microwave energy to circularly polarized microwave energy, comprising:

an elongated hollow conductive waveguide having four elongated walls;

an elongated planar conductive septum positioned within said waveguide between a first wall and a second wall that is opposite said first wall; and

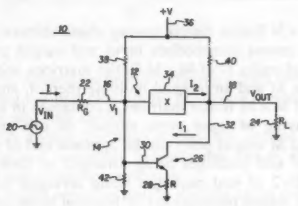
a first trapped mode resonator positioned within said waveguide, within the plane formed by the septum, and comprising a thin elongated electrically conductive structure protruding from the first wall of the waveguide for producing a resonant response in the phase response of the polarizer at a resonant frequency.

4,356,460

SPLIT PHASE DELAY EQUALIZER WITH REDUCED INSERTION LOSS

Vernon R. Cunningham, Melissa, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 8, 1980, Ser. No. 214,299
Int. Cl.³ H03H *11/12*
U.S. Cl. 333—28 R **7 Claims**



1. A split phase delay equalizer using a single transistor which has a transfer function complying with the Equation

$$T = \frac{R - X}{M\left[\sqrt{\frac{RL}{R}}\,(RL + RG + \frac{(RG \cdot RL)}{R} + X)\right]}$$

where R is a transistor gain stabilizing resistor as referenced infra,

where RL is the load resistance seen by the equalizer,

where RG is the signal source resistance seen by the equalizer, and

where X is the impedance of a circuit branch as referenced infra, comprising, in combination:

a pair of circuit branches connected in parallel between an input and an output;

a transistor in one of said pair of circuit branches for providing a 180 degree phase inversion of the signal in that branch;

reactance means X in the other one of said pair of circuit branches for providing a phase shift of the signal in that branch;

a resistance means R connected in circuit with the transistor in said one of said pair of circuit branches, said equalizer receiving signals from a generator having an impedance of RG and connected to supply signals to a load having a resistance value RL; and

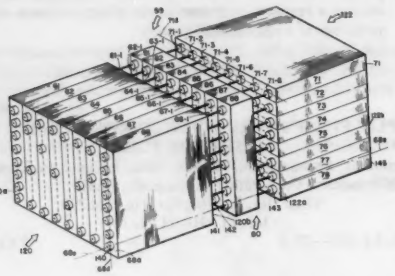
means connecting the base of said transistor to said input and connecting one of the emitter and collector of said transistor to the output, wherein said reactance means is connected in feedback relation from said one of the emitter and collector of said transistor to the base of said transistor.

4,356,461

PRACTICAL IMPLEMENTATION OF LARGE BUTLER MATRICES

Joseph H. Acoraci, Phoenix, Md., assignor to The Bendix Corporation, Southfield, Mich.

Filed Jan. 14, 1981, Ser. No. 225,071
Int. Cl.³ H01P *5/18*
U.S. Cl. 333—116 **8 Claims**



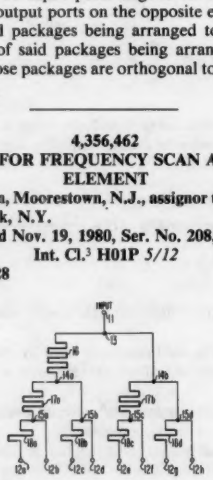
1. An N×N Butler matrix having phase shifters and interconnecting means intermediate input and output ports comprised of a plurality D of M×M Butler matrices, wherein N is greater than M and an integral multiple thereof, and wherein each of said M×M Butler matrices is contained in a stackable package having M input ports aligned on one end of said package and M output ports on the opposite end of said package, D/2 of said packages being arranged to form an input stack and D/2 of said packages being arranged to form an output stack whose packages are orthogonal to the packages of said input stack.

4,356,462

CIRCUIT FOR FREQUENCY SCAN ANTENNA ELEMENT

David F. Bowman, Moorestown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 19, 1980, Ser. No. 208,425
Int. Cl.³ H01P *5/12*
U.S. Cl. 333—128 **9 Claims**



1. A power distribution network for use in a frequency scanning antenna system responsive to signals applied to an input port for providing at a plurality of output ports output signals of substantially even power distribution and, at a predetermined frequency, a fixed phase relationship, said network comprising:

a first power divider comprising a common port coupled to said input port and having m_1 branch ports for dividing power applied to said common port equally into said m_1 branch ports;

m_1 transmission lines with each of said m_1 lines coupled at a first end to a corresponding one of said m_1 branch ports of said first power divider and having second ends;

m_1 power dividers, each comprising a common port coupled to a corresponding one of the second ends of said m_1 transmission lines, and having m_2 branch ports for equally dividing power applied to the common ports of said m_1 power dividers;

means including power dividers and transmission lines coupled in like manner at successive levels of power division for providing, at the n^{th} level of power division,

$$\prod_{i=1}^{n-1} m_i$$

power dividers having

$$\prod_{i=1}^{n} m_i$$

branch ports and

$$\prod_{i=1}^{n} m_i$$

transmission lines each having first ends coupled to a corresponding one of the

$$\prod_{i=1}^{n} m_i$$

branch ports of said

$$\prod_{i=1}^{n-1} m_i$$

power dividers and having second ends coupled respectively to said plurality of output ports, wherein said transmission lines coupled to the branch ports of said power dividers have electrical lengths at said predetermined frequency which are interrelated at the j^{th} level of power division according to

$$\phi, \phi + k \prod_{i=j+1}^{n} m_i, \phi + 2k \prod_{i=j+1}^{n} m_i, \ldots,$$

$$\phi + \left(\prod_{i=1}^{j} m_i - 1 \right) k \prod_{i=j+1}^{n} m_i$$

where $0<j\leqq n$, ϕ is an arbitrary electrical length at said predetermined frequency, and k is a non-zero constant, such that the electrical lengths of any pair of said

$$\prod_{i=1}^{n} m_i$$

transmission lines differ by a multiple of the wavelength at said predetermined frequency, thereby providing said fixed phase relationship of the signals of said predetermined frequency at all of said output ports and predetermined phase differentials at other frequencies.

4,356,463

FILTERING DEVICE USING THE TRANSFER OF ELECTRICAL CHARGES INTO A SEMICONDUCTOR

Roger B. Gonin; Daniel Forster, and Jean E. Picquendar, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Nov. 21, 1979, Ser. No. 96,328
Claims priority, application France, Nov. 21, 1978, 78 32765
Int. Cl.³ H03H *15/02*; G11C *27/02*
U.S. Cl. 333—165 **10 Claims**

1. A filtering device using the transfer of electrical charges

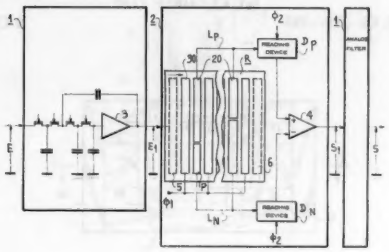
into a semiconductor, comprising at least one analog filter of at least the second order in series with a transverse charge transfer filter constituted by:

a charge transfer shift register having a plurality of stages, said register being on a semiconductor substrate covered with an insulating layer, transfer electrodes constituting these stages being placed on the insulating layer parallel to one another and transversely positioned with respect to the direction of the charges and ensuring the transfer of charges into the substrate from one stage of the register to the next in the case of the periodic application of given potential;

means for the injection of charges corresponding to the sampled input voltage of the charge transfer filter;

weighting means connected to the output of the stages of the register allocating a weighting coefficient to the quantity of charges having passed through each stage;

means fixing the sign of the weighting coefficients;



summation and reading means for the quantities of weighted charges, said means supplying the electrical output signal of the charge transfer filter;

means ensuring the discharge of the charges having passed through the final stage of the register; wherein the analog filter or filters cooperate with the charge transfer filter contributing to reducing the attenuation produced by the charge transfer filter at its sampled input voltage in such a way that in its useful frequency band the attenuation of the filtering device is substantially zero, with $Att = 20 \log_{10}(E/S)$, E and S being the input and output voltages of the device, and said analog filter or filters cooperate with the charge transfer filter contributing to the increase, outside said frequency band, of the attenuation provided by the charge transfer filter at its sampled input voltage in such a way that outside this frequency band the attenuation of the filtering device is very high.

4,356,464

FILTER FOR ELECTRIC SIGNALS CONSISTING OF SWITCHES, CAPACITORS AND AMPLIFIERS

Alfred Fettweis, Bochum, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

PCT No. PCT/EP79/00064, § 371 Date May 15, 1980, § 102(e) Date May 15, 1980, PCT Pub. No. WO80/00644, PCT Pub. Date Apr. 3, 1980

PCT Filed Aug. 21, 1979, Ser. No. 196,554

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1978, 2840346

Int. Cl.³ H03H *19/00*; H03K *5/153*

U.S. Cl. 333—173 **11 Claims**

1. In an electric filter comprised of switches, capacitors, and amplifiers, the combination comprising:

at least one voltage reversal switch operating to produce a voltage at first and second switch terminals, subsequent to actuation of the voltage reversal switch, which is equal in magnitude but of opposite polarity to the voltage at such terminals prior to actuation of the voltage reversal switch, said voltage reversal switch comprising:

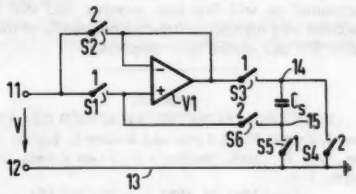
a capacitor for storing the voltage presented thereto during a first clock pulse phase;

means for connecting said first switch terminal to a reference potential;

amplifying means;

first connecting means including said amplifying means and a first switch operated during a first clock pulse phase for connecting said second terminal to said capacitor;

second connecting means including said amplifying means and a second switch operated during a second clock pulse phase for connecting said capacitor to said second terminal;



said first connection means including a third switch operated during the first clock pulse phase and connected in series with said first switch;

a fourth switch operated during the second clock pulse phase and connected between one end of said capacitor and said reference potential;

a fifth switch operated during the first clock pulse phase and connected between the other end of said capacitor and said reference potential; and

said second connection means including a sixth switch operated during the second clock pulse phase and connected in series with said second switch.

4,356,465

ELECTRIC CONTACT SWITCHING DEVICE

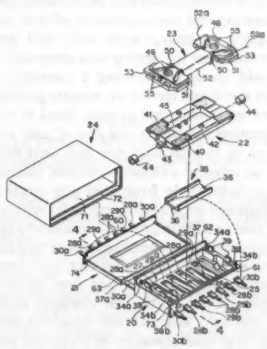
Shunichi Agatahama, Osaka, Japan, assignor to Omron Tateisi Electronics, Co., Kyoto, Japan

Filed Mar. 11, 1981, Ser. No. 242,534

Claims priority, application Japan, Mar. 15, 1980, 55/32879; Feb. 14, 1981, 56/20365; Feb. 16, 1981, 53/20967[U]; Feb. 16, 1981, 56/21671

Int. Cl.³ H01H *67/02*

U.S. Cl. 335—128 **8 Claims**



1. Electric contact switching device comprising:

a plurality of contact member pairs arranged in parallel with each other, each pair consisting of a first lead member

having a first contact and a second lead member having a second contact, said first and second contacts being disposed in mutually opposed relation;

a first insert-molded base member having a compartment and carrying said second lead members at their portions adjacent to said second contacts and said first lead member so as to support said first and second contacts within said compartment;

a second insert-molded base member carrying said second lead members away from said first base member; and

contact driving means for driving said first and/or second contacts to provide close-and-open switching operations;

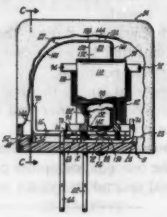
the respective intermediate portions of said second lead members between said first and second base members being bent so as to allow said second base member to be mounted on said first base member, and said first and second lead members extending outwardly of the respective first and second base members.

4,356,466

ELECTROMAGNETIC SOLENOID RELAY

Samuel J. Brown, South Lyon, and Jerome L. Lorenz, Birmingham, both of Mich., assignors to Essex Group, Inc., Fort Wayne, Ind.

Filed May 21, 1981, Ser. No. 265,864
Int. Cl.³ H01H *51/06, 1/12*
U.S. Cl. 335—203 **6 Claims**



2. An electromagnetic solenoid relay comprising;

a base;

an electromagnet mounted on said base, said electromagnet including a bobbin having a bore extending axially therethrough, and an electrically energizable coil wound on said bobbin;

a plunger armature having spaced transverse ends and longitudinal sides therebetween, said armature being slidably located in said bore of the bobbin for linear reciprocation between an at-rest position and an actuated position upon the energization and deenergization of said coil;

a resilient spring in engagement with said armature and secured to said base for urging said armature to its at-rest position, said spring comprising a continuous length of spring strip metal and having an arcuate portion extending between an anchorage end portion fixed to said base and and arm portion overlying one end of said armature and arranged so as to abut said one end, said spring further including an integral extension portion extending at substantially a right angle from said arm portion into said bore and disposed substantially parrallel with a side of said armature, said extension portion terminating in an integral hook portion overlying the other end of said armature and arranged so as to abut said other end, said armature being axially constrained between said arm portion and said hook portion of the spring for conjoint motion of said armature and said arm portion whereby said spring is effective to urge said armature to its at-rest position upon deenergization of said coil, said armature and said spring being held together in operative relation solely by abutting engagement therebetween whereby there is a freedom of motion between said armature and said spring permitting the armature to align itself with said electromagnet upon energization of said coil;

first and second terminals mounted on said base;

a first contact on said first terminal;

a second contact on said hook portion of the spring arranged to engage said first contact upon movement of said armature to its actuated position and to disengage from said first contact upon return of said armature to its at-rest position; and

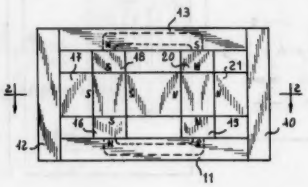
means connecting said anchorage portion of said spring to said second terminal.

4,356,467

MAGNETIC WORK-HOLDING DEVICE

Michele Cardone; Angelo Grandini, and Bruno Zaramella, all of Milan, Italy, assignors to Magento Tecnica di Cardone Michele & C.S.n.c., Milan, Italy

Filed Oct. 4, 1979, Ser. No. 82,212
Claims priority, application Italy, Oct. 6, 1978, 28502 A/78
Int. Cl.³ H01F *7/20*
U.S. Cl. 335—295 **8 Claims**



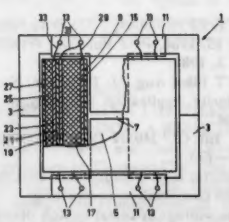
1. A magnetic work-holding device comprising: pole pieces fed by magnets and defining a work-holding surface for one or more work-pieces, there being at least two pole pieces fed by a main permanent magnet means disposed therebetween, at least two corresponding sides of each of said pole pieces cooperating with a secondary permanent magnet means, the secondary magnet means being magnetized in a direction to present to the pole of the same sign as the cooperating pole of the main magnet means, and an external ferromagnetic yoke short-circuiting the remaining poles of the secondary magnet means, at least one of said magnet means being invertible in magnetic field to activate or deactivate said work-holding surface.

4,356,468

TRANSFORMER WITH MAGNETIC SCREENING FOILS

Jan van Laar, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 29, 1980, Ser. No. 154,563
Claims priority, application Netherlands, Jun. 5, 1979, 7904379
Int. Cl.³ H01F *15/04*
U.S. Cl. 336—69 **12 Claims**



1. A transformer comprising a ferromagnetic core having one leg which supports a primary winding and at least one

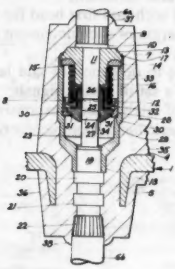
secondary winding, said windings being coaxial and insulated from each other, an electrically conductive screening foil positioned between the windings and said core leg and made of a soft-magnetic material, and electrically conductive screening foil means located beteen the primary and the secondary windings, and wherein the screening foil and the screening foil means are electrically connected to connection leads.

4,356,469

ELECTRICAL TERMINAL WITH THERMAL INTERRUPTER

Hilliard Dozier, c/o U.S. Terminals, Inc. 7502 Camargo Rd., Cincinnati, Ohio 45243

Filed Nov. 20, 1980, Ser. No. 208,660
Int. Cl.[3] H01H *37/76*
U.S. Cl. 337—401 **19 Claims**



1. A temperature responsive terminal pin construction comprising a tubular casing, an axially aligned pair of conductive terminal pin parts inserted in the opposite ends of said casing, means fixedly securing said pin parts in said casing with their innermost ends in spaced apart relation to define a gap therebetween, a split ring collet adapted to surround said pin parts and make electrical contact therewith, said collet having a first position of use in which it bridges the gap between said pin parts, and a second position of use in which said collet is displaced axially so as to open the gap between said pin parts, spring means positioned to urge said collet from its first to its second position of use, and a thermosensitive annular ring having a predetermined melting point positioned to normally maintain said collet in its first position of use against the compression of said spring means, said collet having an enlarged head and said annular ring having a nose engaging the head of the collet, whereby if a temperature sufficient to cause the nose of the thermosensitive ring to melt is generated within the terminal pin, the collet will be released for movement from its first to its second position of use to break the electrical connection between said pin parts, and means in association with the nose of said thermosensitive ring urging the collet into tight engagement with said pin parts when said collet is in its first position of use.

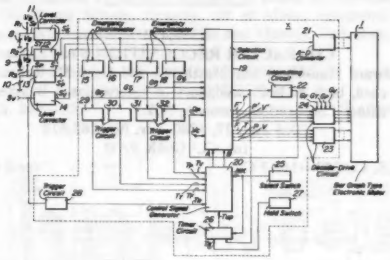
4,356,470

MULTIFUNCTION ELECTRONIC METER FOR VEHICLE

Kouichi Kogawa; Teruo Kawasaki, both of Yokohama; Hiroyuki Nomura, Fujisawa, and Hiroshi Yano, Higashiyamato, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 17, 1980, Ser. No. 188,108
Claims priority, application Japan, Sep. 25, 1979, 54-121970
Int. Cl.[3] G08B *19/00*
U.S. Cl. 340—52 F **4 Claims**

1. A multifunction electronic meter for a vehicle comprising:
an electronic indicator on a display section of which a plurality of informations derived respectively at least from a fuel amount sensor, a water temperature sensor, an oil pressure sensor and a battery are selectively displayed together with a plurality of symbolmarks provided respectively for identifying and warning said plurality of informations displayed selectively on said display section,
a display control circuit for controlling said display section such as a principal information consisting of an amount of fuel among said plurality of informations is ordinarily displayed and, when either one of said plurality of informations other than said principal information is selected, said one information is displayed, together with a respective one of said plurality of symbolmarks,
a plurality of emergency discriminators for discriminating respectively a plurality of emergencies relating respectively at least to the poor fuel amount, the too high water temperature, the too low oil pressure, and the too low battery voltage,
a switching circuit arranged so that, when either one of said plurality of emergency discriminators discriminates one of



said plurality of emergencies, the information relating the discriminated emergency is displayed regardless of the contents of the display on said display section of said electronic indicator,
a self-reversion circuit arranged so that said principal information is displayed automatically reversionally when a predetermined time duration is expired after one of said plurality of informations other than said principal information is selectively displayed,
a hold switch for holding either one of said plurality of informations other than said principal information as it is displayed selectively by annulling the operation of said self-reversion circuit, and
an initially setting circuit arranged so that the information which is held by the operation of said hold switch as it is displayed selectively is switched over reversionally to said principal information when an ignition switch is closed.

4,356,471

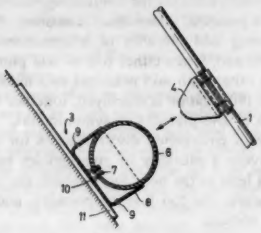
GAS PEDAL MOVEMENT DAMPER

Heinrich Nienaber, Klusenweg 10, D-584 Schwerte, Fed. Rep. of Germany

Filed Nov. 6, 1980, Ser. No. 205,501
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1979, 7931507[U]
Int. Cl.[3] B60Q *1/54;* G08B *21/00*
U.S. Cl. 340—52 R **5 Claims**

1. Apparatus for damping a motor vehicle operator's movement of a gas pedal comprising a base plate mounted to a floorboard surface beneath the gas pedal, and a damping assembly located on said base plate for engagement with the gas pedal upon downward movement thereof, said damping unit having biasing means for providing a force against the gas pedal, which force progressively increases as the gas pedal is

depressed further towards said floorboard surface, wherein said biasing means comprises a spherically shaped, elastic



hollow body having at least one air outlet means formed therein.

4,356,472

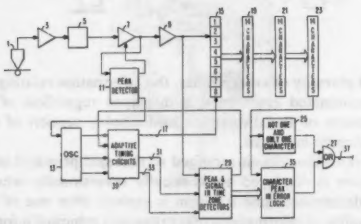
CHARACTER RECOGNITION SYSTEM

Edward Hau-Chun Ku, Matthews, and Gene D. Rohrer, Concord, both of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 27, 1980, Ser. No. 163,672

Int. Cl.³ G06K *9/00*

U.S. Cl. 340—146.3 C **3 Claims**



1. A character recognition system comprising, in combination, scanning means for scanning characters to be read, said scanning means providing output signals distinctive for each character, said signals having at least one peak signal having an amplitude and time of occurrence characteristic of the character, peak determining means for determining the magnitude of said peak signal, timing means including a base oscillator and means for deriving a plurality of timing signals from the output of said oscillator, and delay means connected to said timing means for delaying said timing signals by predetermined amounts, said delay means being governed by said peak determining means and including a delay control trigger connected to said peak determining means, and to a plurality of delay timing circuits for governing the generation of said delayed timing signals, inhibiting means for inhibiting said delay control trigger when the scanning output signals indicate the scanning of predetermined characters, and circuit means for supplying the delayed signals to said system.

4,356,473

MONETARY DOCUMENT PROFILE LOCATION AND PREDETERMINED SELECTED PATH APPARATUS

William E. Freudenthal, Marlboro, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Sep. 23, 1980, Ser. No. 190,006

Int. Cl.³ G06K *9/04*

U.S. Cl. 340—146.3 H **5 Claims**

1. Apparatus for locating the denomination indicia contiguous with the Treasury seal on documents of United States paper currency each having a portrait thereon and a margin thereabout and said indicia being imprinted with magnetically susceptible iron oxide ink and said seal being printed with ink that is not magnetically susceptible, and for selecting a predetermined longitudinal path through said indicia comprising

means for transporting said documents, lengthwise, along a course;

means associated with said course for magnetizing the iron oxide ink printing of documents transported therealong;

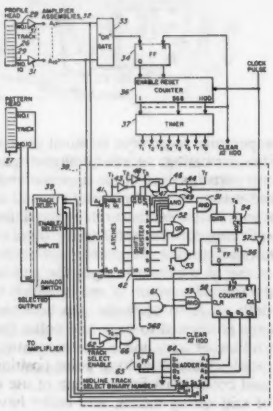
a first magnetic reproduce head, associated with said course, having a plurality of tracks oriented along a line substantially perpendicular to the direction of motion of each document transported thereagainst;

a second magnetic reproduce head, associated with said course, having a like plurality of tracks oriented along a line substantially perpendicular to the direction of motion of each document transported thereagainst, said tracks of said second head being aligned with said tracks of said first head in the course direction;

means associated with said first head for detecting a leading edge of said margin of each document transported against said first head;

means responsive to detection of said leading edge margin for producing a set of timing signals;

a like plurality of latch means responsive to said tracks of said first magnetic head upon receipt of one of said timing



signals indicative of a likelihood of a portion of said denomination indicia being in proximity to said first head;

shift register means having a like plurality of stages responsive to said latch means when said likelihood of a portion of said denomination indicia is initially in proximity to said first head;

means for applying a series of clocking pulses for shifting said shift register means at a time interval when said likelihood of a portion of said denomination indicia is in proximity to said first head;

counting means for providing a count at an output thereof;

means for clearing said counting means prior to detection of said leading edge margin;

means for incrementing the count of said counting means by effectively applying a single clocking pulse thereto prior to said interval and for applying additional clocking pulses thereto during said interval;

means responsive to the outputs of a plurality of selected stages of said shift register means being in the same state for providing a track select enable signal and for causing said counting means to cease incrementation, though some or all of said additional clocking pulses have yet to be applied to said counting means during said interval;

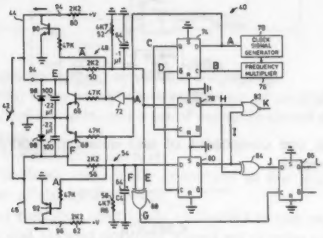
an amplifier; and

switching means, enabled by said track select enable signal, and responsive to said count of said counting means for selecting one of said tracks of said second magnetic reproduce head for coupling to said amplifier, whereby, said amplifier becomes adapted to provide a signal indicative of said predetermined longitudinal path through said indicia.

4,356,474
ALARM SYSTEM

Peter Humphries, Bolton, and Paul Aeberli, Tottenham, both of Canada, assignors to Contronic Controls Limited, Mississauga, Ontario, Canada

Filed Mar. 6, 1981, Ser. No. 241,268
Claims priority, application Canada, Mar. 6, 1980, 347124
Int. Cl.[3] G08B *19/00*
U.S. Cl. 340—509 **5 Claims**

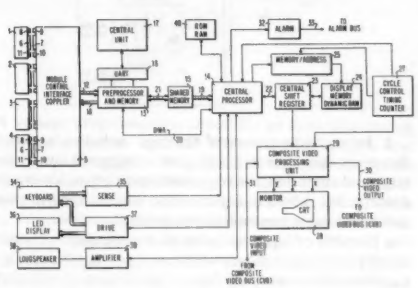


1. A digital alarm system, comprising:
first and second electrically conductive loops;
current generating means electrically connected to the first and second loops for generating a first current in first loop and a second current in the second loop;
a first resistor electrically connected to the first loop so that the first current produces a first current produced voltage across the first resistor and so that a break in the first loop or an electrical shorting of the first loop to a ground point causes the magnitude of the voltage drop across the first resistor to drop to zero;
a second resistor electrically connected to the second loop so that the second current produces a second current produced voltage across the second resistor and so that a break in the second loop or an electrical shorting of the second loop to a ground point causes the magnitude of the voltage drop across the second resistor to drop to zero;
an alarm switch electrically connected between the first and second loops and adapted to electrically short the first loop to the second loop when closed;
first switching means electrically connected to the first and second resistors for alternatingly short-circuiting the first and second resistors;
second switching means connected to the first and seconmd loops and synchronized with the first switching means for alternatingly shorting the ends of the first loop to one another and the ends of the second loop to one another, so that the ends of the first loop are shorted together when the first resistor is short-circuited and the ends of the second loop are shorted together when the second resistor is short-circuited;
recording means electrically coupled to the first and second resistors for producing a first state signal indicative of the magnitude of the voltage drop existing across the first resistor during the most recent time interval in which the first resistor was not short-circuited by the first switching means, the first state signal having a first value when the first resistor voltage drop corresponds to the first current produced voltage and a second value when the first resistor voltage drop is substantially zero, and a second state signal indicative of the magnitude of the voltage drop existing across the second resistor during the most recent time interval in which the second resistor was not short-circuited by the first switching means, the second state signal having a first value when the second resistor voltage drop corresponds to the second current produced voltage and a second value when the second resistor voltage drop is substantially zero;
alarm signal generating means electrically coupled to the recording means for generating an alarm signal when both the first and second state signals have their second values; and,
fault signal generating means electrically coupled to the recording means for generating a fault signal when one of the first and second state signals assumes its second value.

4,356,475
SYSTEM CONTAINING A PREDETERMINED NUMBER OF MONITORING DEVICES AND AT LEAST ONE CENTRAL STATION

Leopold Neumann, Lexington; Richard B. Kline, II, Stoneham, and Wolfgang Scholz, Beverly, all of Mass., assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 12, 1980, Ser. No. 186,710
Int. Cl.[3] G08B *29/00*; H04N *7/12*
U.S. Cl. 340—521 **17 Claims**



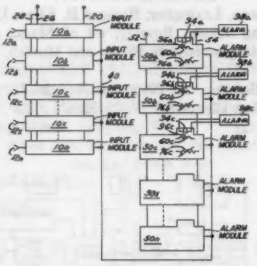
1. A system containing a predetermined number of monitoring devices and at least one central station having a central display device, each monitoring device having at least one signal generator, whose output signals can be displayed on a display device associated therewith as a specific image of the monitoring device, and said system further containing a selecting device for connecting said central station to the signal generator of a preselected one of said monitoring devices in such a way that said central station can receive output signals from the signal generator of said preselected one of said monitoring devices for display on said central display device, characterized in that said selecting device comprises
(a) a central multiplexer which is connected between said signal generators of said monitoring devices and said central display device of said central station, said multiplexer having a separate signal input for each output signal of said signal generators and having a first and second number of outputs, said first number of multiplexer outputs being connectible to said central display device;
(b) an intermediate memory having its signal input connected to said second numoer of multiplexer outputs and having its signal output connectible to said central display device; and
(c) a control unit for controlling said multiplexer in such a way that in a time multiplexing sequence said multiplexer supplies to said first number of multiplexer outputs undelayed signal data which originate from the signal generator of a single one of said monitoring devices, while said multiplexer supplies to said second number of outputs delayed signal data of all said signal generators, whereby

said delayed data are stored in said intermediate memory for being called from there in any signal combination for the purpose of display as a mixed image on said central display device.

4,356,476
MULTIPLE ALARM DETECTOR MONITORING AND COMMAND SYSTEM

William E. Healey, Bloomfield Hills, Mich., and Morse R. Heineman, White Rock, N. Mex., assignors to W. E. Healey & Associates, Inc., Bloomfield Hills, Mich.

Filed Sep. 15, 1980, Ser. No. 187,355
Int. Cl.³ G08B *19/00*
U.S. Cl. 340—522 15 Claims



1. In an alarm system of the type including a plurality of detectors, each detector having an untriggered condition and a triggered condition, the triggered condition indicating that the detector has sensed a condition for which an alarm should be indicated, the improvement comprising:

a plurality of input modules, each associated with and electrically connected to one detector, each input module being capable of providing an output signal having a pre-selected (value) voltage level only when the detector associated therewith is in a triggered condition; and

alarm command means electrically connected to and receiving said output signals from all of said plurality of input modules, said alarm command means being capable of providing a command signal only when said input modules are simultaneously providing output signals and said output signals having a sum of at least a predetermined voltage level.

4,356,477
FM/AM ELECTRONIC SECURITY SYSTEM

Jan Vandebult, 32 Averill St., Topsfield, Mass. 01983

Filed Sep. 30, 1980, Ser. No. 192,369
Int. Cl.³ G08B *13/24*
U.S. Cl. 340—572 22 Claims

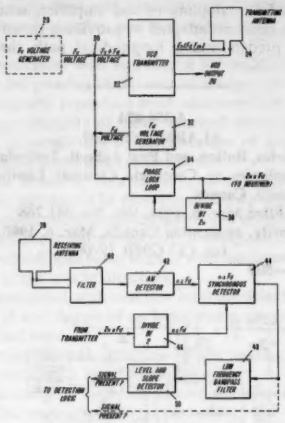
1. An electronic security system comprising:

transmitter means for providing an electromagnetic field in a predetermined area by transmitting a signal at a center frequency F_c, said signal being frequency modulated by a detection signal at a detection modulation frequency F_d and said center frequency being swept through a range of frequencies;

a resonant tag circuit having at least one resonant frequency within said range of frequencies;

receiver means for detecting a signal having a frequency which is at least a component of said detection modulation frequency F_d in said predetermined area; and

detection logic means for providing an alarm in response to detection of said signal having a frequency which is at

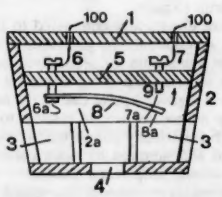


least one component of said detection modulation frequency F_d.

4,356,478
EMPLOYING A SHAPE MEMORY ALLOY IN A FIRE ALARM TEMPERATURE SENSITIVE ELEMENT

Jürg Muggli, Männedorf, and Peter Müller, Oetwil-am-See, both of Switzerland, assignors to Cerberus AG, Männedorf, Switzerland

Filed Apr. 17, 1980, Ser. No. 140,464
Claims priority, application Switzerland, May 21, 1979, 4719/79
Int. Cl.³ G08B *17/06;* H01H *37/60*
U.S. Cl. 340—593 12 Claims



1. In a fire alarm containing a temperature sensitive element, which upon exceeding a predetermined critical temperature triggers an alarm signal due to a change in the shape of said temperature sensitive element, the improvement which comprises:

said temperature sensitive element containing a shape memory alloy which, upon exceeding the critical temperature, returns into its originally impressed shape;

said shape memory alloy possessing a hysteresis behavior;

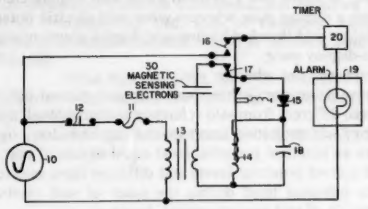
said shape memory alloy having a lower temperature threshold, different from the critical temperature at which the shape memory alloy element returns to its originally impressed shape; and

said shape memory alloy element, upon cooling to such lower temperature threshold, again altering its shape back at least approximately into an altered shape which it possessed due to a prior cold working of said shape memory alloy element.

4,356,479
ENURESIS DETECTOR AND ALARM

Reginald D. Wilson, 2601 Roslyn Ave., Baltimore, Md. 21216

Continuation of Ser. No. 62,489, Jul. 31, 1979, Pat. No. 4,271,406. This application Sep. 23, 1980, Ser. No. 190,032
The portion of the term of this patent subsequent to Jun. 2, 1998, has been disclaimed.
Int. Cl.[3] G08B *21/00*
U.S. Cl. 340—604 6 Claims

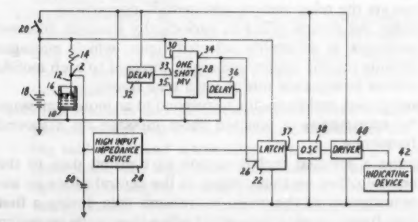


1. A moisture sensing apparatus, comprising:
a latching relay including a coil, a set of normally open electrical contacts, and a set of normally closed electrical contacts;
a source of electrical current;
a first electrode electrically connected to one side of said source of electrical current;
a second electrode electrically connected to one end of said relay coil via said normally closed set of relay contacts;
means for connecting a second end of said relay coil to a second side of said source of electrical current;
said first and second electrodes, said normally closed set of relay contacts and said relay coil forming an electrical circuit which is disabled upon energization of said relay coil;
said first and second electrodes positioned adjacent to each other but electrically separated by a space which may be electrically closed by urine; and
an alarm means responsively connected to said set of normally open contacts.

4,356,480
LIQUID LEVEL SENSING CIRCUITRY

Daryl D. Dressler, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 11, 1980, Ser. No. 186,213
Int. Cl.[3] G08B *21/00*
U.S. Cl. 340—620 17 Claims

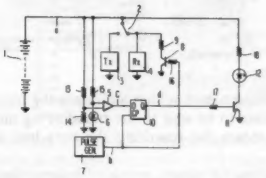


1. Liquid level sensing circuitry including
first means adapted for connection to an electrical source of power for providing continuous energization of said first means, said first means including a conductive probe for providing a first signal when the liquid level sensed is in contact with said conductive probe and a second signal when the liquid level sensed is not in contact with said conductive probe;
second means operatively connected to said first means and including a switch having a first and second position, said second means storing said first and second signals in response to operation of said switch to said second position;
and third means operatively connected to said second means for providing a discernible indication in response to the storing of said second signal by said second means, said indication terminating when said switch is operated to said first position.

4,356,481
SOURCE VOLTAGE DROP DETECTING CIRCUIT

Takakuni Kuki, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Apr. 9, 1980, Ser. No. 138,948
Claims priority, application Japan, Apr. 11, 1979, 54-43991
Int. Cl.[3] G08B *21/00;* G01R *19/16*
U.S. Cl. 340—636 8 Claims



1. A voltage drop detection circuit for an apparatus having first electronics means operable when supplied with a first current for performing a first function, second electronics means operable when supplied with a second current greater than said first current for performing a second function, and a battery selectively connected to said first and second electronics means in a time-division fashion, the drop in voltage of said battery being detected when it reaches a predetermined value, said detection circuit comprising: third means for generating a series of pulses; fourth means selectively connected to said battery and adapted to conduct during the period of said pulses an auxiliary current substantially equal to the difference between said first and second current in response to said series of pulses during the operation of said first means; and fifth means for comparing the output voltage of said battery with a predetermined reference voltage to provide a detection signal.

4,356,482
IMAGE PATTERN CONTROL SYSTEM

Tetsuji Oguchi, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jun. 2, 1980, Ser. No. 155,378
Claims priority, application Japan, Jun. 5, 1979, 54-70341
Int. Cl.[3] G09G *1/16;* G06F *3/14*
U.S. Cl. 340—731 9 Claims

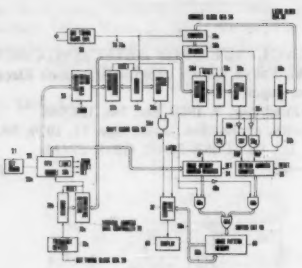
1. An image pattern control system comprising:
a dynamic memory:
a zoom ratio hold register;
an address register which stores addresses for reading out the contents of said dynamic memory;
a refresh address counter which stores addresses of the contents read out from said dynamic memory for refreshing;
a switch circuit which sends out a control signal at a predetermined timing according to an output of said zoom ratio hold register; and
a switch circuit which, under the control of the control signal, selects outputs of the address register and the refresh address counter to send out the output of said address register to said dynamic memory during a first per-

iod and the output of said refresh address counter to said dynamic memory during a subsequent second period, whereby said dynamic memory reads stored data according to said address register output during said first period and refreshes stored data according to said refresh address counter output in said subsequent second period related to a magnified display.

7. A system with memory refreshing function comprising:

a dynamic memory for storing data corresponding to addresses;

means for transferring the data read out of the memory;



first addressing means which addresses the memory to read out the data to be sent to the transferring means;

refreshing means for rewriting the data into the memory; and

second addressing means, provided independent of the first addressing means, for generating addresses for read-out of the data to be refreshed,

whereby the data for the addresses designated by the second addressing means are refreshed while the data designated by the first addressing means are delivered out through the transferring means.

4,356,483

MATRIX DRIVE SYSTEM FOR LIQUID CRYSTAL DISPLAY

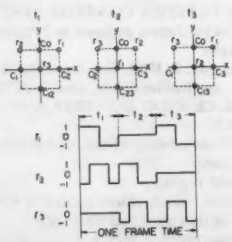
Hiroo Fujita, Sayama, and Akira Tsuzuki, Tokyo, both of Japan, assignors to Citizen Watch Company, Limited, Tokyo, Japan

Continuation of Ser. No. 877,032, Feb. 10, 1978, abandoned. This application Jul. 14, 1980, Ser. No. 168,138

Claims priority, application Japan, Feb. 14, 1977, 52-14287; Apr. 30, 1977, 52-50584

Int. Cl.³ G09G *3/36*

U.S. Cl. 340—805 **3 Claims**



1. In a liquid crystal display device comprising:

a plurality of row conductors;

a plurality of column conductors each intersecting said row conductors in a matrix configuration so that intersections define a display element whereby an electric potential applied across a pair of said row and column conductors above a threshold value energies and turns on said display element; means for cyclically applying electrical row drive signals to said row conductors, said row drive signals having a cycle time T divided into an integral number of excitation intervals of predetermined duration;

means for cyclically applying electrical column drive signals to said column conductors, said column drive signals varying, in said excitation intervals, at first and second potential levels and a reference potential level between said first and second potential levels whereby when the electric potential caused by said row and column drive signals applied to said row and column conductors respectively is above said threshold value said display element attain a display state whereas when said electric potential is below said threshold value said display element attain a non-display state;

the improvement wherein:

said row drive signals have said first and second potential levels, different from said reference potential level, during one of said excitation intervals and said row drive signals have an identical potential level equal to one of said first and second potential levels and different from said reference potential level during the other of said excitation intervals of said predetermined duration.

4,356,484

METHOD FOR TRANSMITTING DATA IN A TIME MULTIPLEX TRANSMISSION

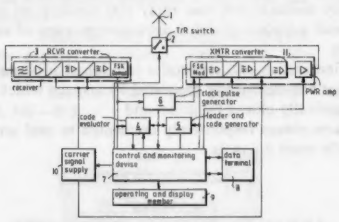
Gert Eckhardt, Backnang, Fed. Rep. of Germany, assignor to Licentia Patent Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 8, 1980, Ser. No. 176,558

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1979, 2932701

Int. Cl.³ H04B *1/00*; H04Q *7/00, 9/00*

U.S. Cl. 340—825.03 **4 Claims**



1. A method for transmitting data between at least one central office and a plurality of mobile radio stations via a relay station by a time multiplex transmission procedure in which signals are transmitted in a succession of time frames and the central office transmits on a first frequency to all mobile radio stations via the relay station, said method comprising:

causing the central office to periodically transmit different messages at arbitrarily selected times, which messages include routine inquiry messages, directed to each mobile station in sequence during each time frame;

causing each mobile station to respond to an inquiry message by transmitting a selected short message on a second frequency;

causing a selected mobile station to transmit data to the central office by transmitting to the central office an announcement of the intent to transmit data during a first time frame, causing the central office to set aside reception capacity for the data in a time frame following the first time frame, and transmitting the data to the central office in the following time frame; and

causing the duration of each time frame to vary, on the basis of data transmitted during at least one preceding time frame, between a minimum value determined by the time required to transmit a routine inquiry to each mobile

station and a maximum value determined by the time required to transmit data of a predetermined length to each mobile station in succession and the time required to transmit data of a predetermined length from each mobile station in succession.

4,356,485

DEVICE FOR THE SIGNAL-TECHNICAL SECURE CONTROL AND MONITORING OF ELECTRICAL LOADS

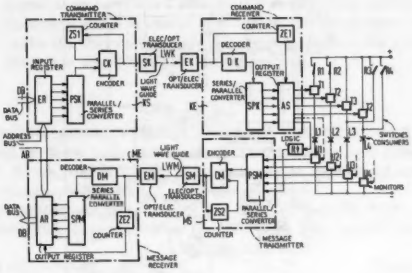
Rainer Boschulte; Heinrich Koehnecke, and Siegfried Muecke, all of Braunschweig, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 25, 1980, Ser. No. 210,308

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1979, 2951932

Int. Cl.³ H04Q *9/00;* **G08G** *1/097;* **H04B** *9/00*

U.S. Cl. 340—825.17 **9 Claims**



1. Apparatus for remotely controlling and monitoring the operational states of a plurality of spatially-proximate loads, comprising:

a control station including a command transmitter operable to cyclically transmit predetermined commands representing desired operating states of the loads;

a command receiver for receiving the commands;

switching means connected between said command receiver and the loads and operable in response to the received commands to condition the loads into the desired operating states;

monitoring means connected to said loads and operable in response to the actual operating states thereof to produce a corresponding message;

a message transmitter for transmitting the messages to said control station;

a message receiver in said control station for receiving the command messages;

comparison means in said control station connected to said command transmitter and said message receiver and operable to produce an alarm signal in response to inequality of content between a command and its reply message after the prescribed cycle interval;

control means in said control station connected to said comparison means and to said command transmitter for causing said command transmitter to transmit logic control commands, said logic control commands being formed by cyclically changing reversely-transmitted commands indicating change-overs from one tranmission to another; and

logic means connected to said command receiver and to the loads, normally conditioned to permit the cyclic predetermined operation of the loads and responsive to the logic control command to condition the loads into a special operating state in the event of the changing logic control commands not occurring over a predetermined cycle time, such non-occurrence being able to be produced by the control means too in response to predetermined disturbances in operation of the control and monitoring means.

4,356,486

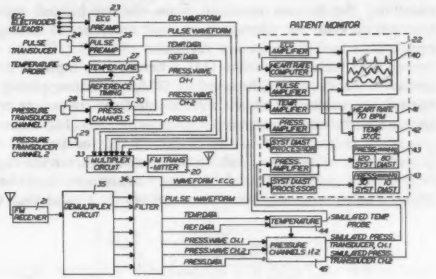
TELEMETERING SYSTEM FOR OPERATING ROOM AND THE LIKE

Bruce E. Mount, Diamond Bar, Calif., assignor to Medimetric Company, Los Angeles, Calif.

Division of Ser. No. 956,593, Nov. 1, 1978. This application Mar. 24, 1980, Ser. No. 133,276

Int. Cl.³ G08C *19/04, 19/16*

U.S. Cl. 340—870.38 **5 Claims**



1. A telemetering system for transmitting temperature information between a temperature probe and a temperature monitor, said probe including a resistor with the resistance thereof varying as a function of its temperature, including in combination:

a transmission link having transmitter and receiver;

a bridge circuit including means for connecting said probe resistor in an arm of said bridge circuit;

a plurality of resistors connected as a first resistor bank;

first switch means for selectively connecting resistors of said first resistor bank in an arm of said bridge circuit;

a counter for actuating said first switch means as a function of the count state of said counter;

first storage means for storing the count state of said counter;

comparator means for producing an output signal when said bridge circuit is balanced and fixing the count state in said first storage means;

means for connecting said count state from said first storage means as one signal of said transmission link and representing said probe resistance;

means for producing a reference signal for said counter;

a plurality of resistors connected as a second resistor bank;

second switch means for selectively connecting resistors of said second resistor bank as an input to said monitor;

second storage means for actuating said second switch means as a function of the count state of said counter; and

means for connecting said count state from said transmission link and said reference signal to said second storage means as inputs for fixing the switches in said second switch means to selectively connect said second resistor bank identically to the connection of said first resistor bank.

4,356,487

SOUNDING APPARATUS

Louis Herbreteau, Bretigny-sur-Orge, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Jul. 2, 1980, Ser. No. 164,543

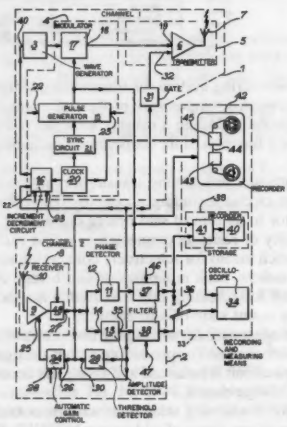
Claims priority, application France, Jul. 6, 1979, 79 17600

Int. Cl.³ G01S *13/95*

U.S. Cl. 343—5 W **8 Claims**

1. A sounding apparatus for the detection and measurement of phenomena relative to the area surrounding the earth's globe, comprising a channel (1) for the transmission of electromagnetic waves in the direction of the phenomenon to be

detected and measured and a channel (2) for receiving the echoes of said waves on the phenomenon, the transmission channel (1) incorporates means (3) for producing continuous electromagnetic waves with fixed regulatable frequencies and regulatable progressive frequencies as a function of a frequency ramp, means (4) for modulating the fixed regulatable frequency continuous waves by regulatable recurrence pulses and for modulating the regulatable progressive frequency waves by regulatable recurrence pulses in such a way that regulatable progressive frequency continuous modulated wave pulses are introduced between regulatable fixed frequency continuous modulated wave pulses of electromagnetic waves, a transmitter (5) receiving the thus modulated electromagnetic waves, and reception channels (2) incorporating a receiver (8) receiving the echoes resulting from the modulated waves transmitted onto the phenomenon, said receiver (8) having a regulatable tuning frequency reception channel (10), the receiver also including means (11) whereof one input is connected to the output of the receiver (8) for detecting phases of the echoes resulting from the regulatable fixed frequency continuous modulated transmitted waves and means (13), whereof one input is connected to the output of the receiver (8) for detecting the amplitudes of the echoes resulting from the regulatable progressive and fixed frequency continuous modulated transmitted waves, wherein the means (4) for modulating the



electromagnet waves by regulatable recurrence pulses incorporate a regulatable recurrence Gaussian pulse generator (15), whereof one output is connected to an input of a modulator (17) which also receives the electromagnetic waves, the output of the said modulator (17) being connected to an input of the transmitter (5), modulating means including a logic synchronization circuit (21) of said regulatable recurrence pulse generator, reception channel (2) further comprising an automatic gain control device (24) as a function of the level of the interference measured at the receiver input at the operating frequency, an output of said device being communicated to a gain control input of the receiver (8), an input of said device being connected to the receiver output, while another input (28) of said device receives an instruction voltage for fixing the receiver gain for each regulatable progressive frequency channel, as a function of the interference level on said channel before any transmission takes place, a treshold detector (29) whose input is connected to the receiver output so as to control the transmitter in order to authorize or refuse transmission on the frequency corresponding to said channel, as a function of the maximum permitted interference level, the transmission channel further including means (16) for incrementing or decrementing the regulatable progressive frequency level by a quantity less than the frequency step of said ramp when transmission is refused in order that the measured value differs little from the intended value, the transmission and reception channels acting in the radio-frequency band between 200 kHz and 30 MHz, the echoes phase detection means (11) being Doppler detection means.

4,356,488

DEVICE FOR INDICATING THE PROXIMITY OF A TARGET

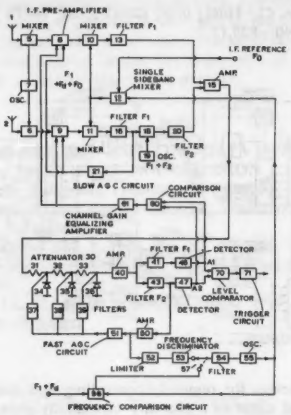
Leonard A. Cram, Winscombe; Brian Jackson, and Montague R. Gilday, both of Wells, all of England, assignors to Electric & Musical Industries Limited, Hayes, England

Filed May 19, 1961, Ser. No. 111,395

Claims priority, application United Kingdom, May 20, 1960, 17995/60

Int. Cl.³ F42C *13/04*

U.S. Cl. 343—7 PF **15 Claims**



1. A device for indicating the proximity of a target comprising means for setting up at least an approximate representation of the direction of the velocity of the target relative to an axis fixed in relation to the device, and signalling means responsive to the direction of the target from the device, namely the sight line of the target for producing an output signal when/between the sight line and the relative velocity direction increases to a predetermined value.

4,356,489

VEHICLE SPEED SENSING APPARATUS WITH ELECTROMAGNETIC WAVE INTERFERENCE DETECTOR

Yukitsugu Hirota, Yokohama; Akira Endo, Katsuta, and Kenji Sekine, Tokyo, all of Japan, assignors to Hitachi, Ltd. and Nissan Motor Co., Ltd., both of Tokyo, Japan

Filed Apr. 22, 1980, Ser. No. 142,816

Claims priority, application Japan, Apr. 27, 1979, 54/51493

Int. Cl.³ G01S *13/93*

U.S. Cl. 343—7 VM **10 Claims**

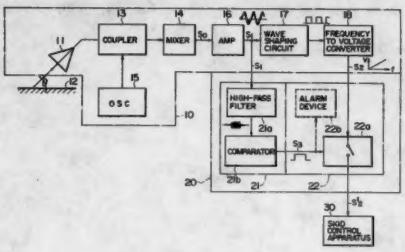
8. A vehicle speed sensing apparatus for use in skid control, comprising:

a Doppler radar unit for a vehicle including means for directing RF energy to a vehicle traveling surface and for receiving reflected RF energy from the surface to produce a Doppler signal related to the speed of the vehicle and means for producing a speed signal from the Doppler signal;

a high-pass filter having a pass band which is above the frequency of a Doppler signal corresponding to a maximum vehicle speed, the filter being connected with the radar unit for extracting noise components from the Dop-

pler signal to produce a noise detection signal therefrom; and

output means including a gate circuit connected for reception of the speed signal and operative to deliver the speed signal as an output to a skid control means when the noise detection signal is absent and to stop the speed signal to make the skid control means inoperative when the noise detection signal is fed to the gate circuit.



4,356,490

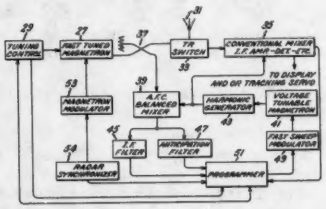
TRANSMISSION FREQUENCY DIVERSITY RADAR

David W. Bray, Ludlowville; John L. David, Clinton, and Erman E. Ferris, Ithaca, all of, N.Y., assignors to General Electric Company, Utica, N.Y.

Continuation-in-part of Ser. No. 855,954, Nov. 25, 1959, abandoned. This application Oct. 27, 1964, Ser. No. 407,626

Int. Cl.[3] G01S *13/24*

U.S. Cl. 343—17.2 R 6 Claims



1. A transmission frequency diversity radar system comprising an oscillator that is tunable over a frequency band to produce a signal for radar transmission, means for tuning said oscillator randomly on a random frequency basis, and means for frequency tracking the signal being transmitted including a variable frequency local oscillator, means to sweep the local oscillator over a range of frequencies within the pulse width time of the radar transmitted signal but after said transmission oscillator is tuned and modulator means responsive to the transmitted signal for holding said variable local oscillator on the proper tuning frequency.

4,356,491

MARINE DIRECTION FINDING SYSTEM

Lee Sczepanski, 6702 W. 164th Pl., Tinley Park, Ill. 60477

Filed Aug. 6, 1980, Ser. No. 175,869

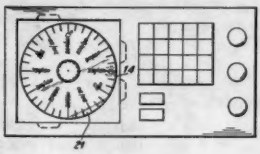
Int. Cl.[3] G01S *3/02*; G09F *9/00*

U.S. Cl. 343—113 R 8 Claims

1. A marine direction finding system for use on a boat having a magnetic heading indicator, comprising:

(a) a radio direction finder means having a direction indicating dial and which indicates a direction bearing between 0° and 360° of a received signal relative to a front of the boat by illumination at a corresponding portion of the dial so as to indicate bearing;

(b) an at least semi-transparent mounting plate and means for attaching the mounting plate in front of the indicating dial; and



(c) a manually settable and rotatable dial which is set to a magnetic heading of the magnetic heading indicator formed as an at least semi-transparent disc rotatably connected to the mounting plate, said rotatable dial being calibrated at a first radius from 0° to 360° and at a second radius also from 0° to 360° in the same rotational direction of marking as the first radius calibration but offset by 180°.

4,356,492

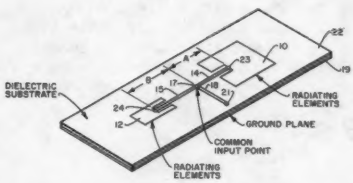
MULTI-BAND SINGLE-FEED MICROSTRIP ANTENNA SYSTEM

Cyril M. Kaloi, Thousand Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 26, 1981, Ser. No. 228,428

Int. Cl.[3] H01Q *1/48*

U.S. Cl. 343—700 MS 2 Claims



1. A multi-band single-feed microstrip antenna system, comprising:

a. a thin ground plane conductor;

b. a plurality of separate thin radiating elements spaced from and electrically separated from said ground plane conductor by a dielectric substrate, one said radiating element for each frequency to be radiated; said respective radiating elements being operable to radiate simultaneously at a different and widely separated frequency from each other, the length dimension of each said respective radiating elements being different and determined by the respective radiation frequency wavelength of each radiating element;

c. each of said radiating elements having a respective feed point thereon;

d. a single common input point;

e. said common input point being fed at all the different respective operating frequencies of said radiating elements;

f. each of said radiating elements having its respective feed connected to said common input point by means of a respective single microstrip transmission line; each one of said radiating elements being matched at its respective operating frequency to the common input point while simultaneously being electrically decoupled from each of the other of said radiating elements through its respective one of said single transmission lines which act as transfor-

mation circuits, thus permitting all said radiating elements to be fed simultaneously from said common input point through said respective single transmission lines, the lengths and widths of each of the respective single transmission lines determining the interdependence between each of said respective radiating elements;

g. each respective single microstrip transmission line which connects said common input point with the feed point on its respective one of said radiating elements being dimensioned to minimize the effect that any one of said radiating elements can have on the other of said radiating elements; the dimensions of said respective single transmission lines being varied such that at the operating frequency of each one of said respective radiating elements the input impedance looking toward the other of said radiating elements from said common input point approaches an open circuit, substantially isolating the respective radiating elements from each other while simultaneously being fed at said different respective frequencies from said common input point;

h. any of the length and width dimensions of each of said single transmission lines and the location of the feed point on each of the respective radiating elements being variable to minimize the effects of any one of said radiating elements on any of the other said radiating elements and thus operate to effectively isolate each of said radiating elements from the other of said radiating elements.

4,356,493

DISC-ON-ROD END-FIRE MICROWAVE ANTENNA

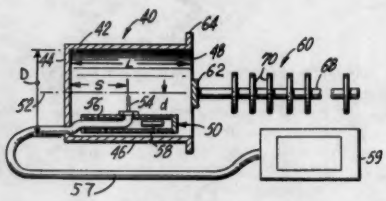
Richard D. Bogner, 4 Hunters La., Roslyn, N.Y. 11576

Filed Dec. 14, 1979, Ser. No. 103,614

The portion of the term of this patent subsequent to Sep. 15, 1998, has been disclaimed.

Int. Cl.³ H01Q *13/28*

U.S. Cl. 343—702 **15 Claims**



1. A probe excited waveguide, comprising:

a metallic container having an elongated axis, and including at least a back wall, side walls, and an open mouth which define an internal cavity;

a metal structure positioned within the container extending in a direction between the back wall and the mouth of the container, spaced from the side walls of the container and contained within at most one half of the volume of the cavity, said half volume being formed by cutting the container along its elongated axis;

a probe extending from the metal structure into the remaining portion of the cavity for excitation of the waveguide;

and further comprising a plate-on-rod end-fire radiator element coupled to the mouth of the container such that said probe excited wave acts as a launcher at the non-radiating end of the radiator element.

4,356,494

DUAL REFLECTOR ANTENNA

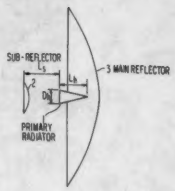
Takashi Katagi; Shuji Urasaki; Takashi Ebisui, all of Kamakura, and Katsuhiko Aoki, Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 23, 1981, Ser. No. 227,902

Claims priority, application Japan, Jan. 30, 1980, 55-9729

Int. Cl.³ H01Q *19/19*

U.S. Cl. 343—781 CA **4 Claims**



1. In a dual reflector antenna having a usable frequency band of at least approximately 1.8 octaves, said antenna having a primary radiator having a radiating aperture for providing a radiated beam, said primary radiator including a horn having an apex, said antenna further comprising a main reflector and a sub-reflector for reflecting said radiated beam to said main reflector, said sub-reflector having a bottom surface which is closest to said primary radiator aperture, said antenna having a t parameter defined by:

$$t = \frac{D_h^2}{8\lambda}\left(\frac{1}{L_h} + \frac{1}{L_s}\right)$$

λ: wave length in free space of said radiated beam,

D_h: diameter of the aperture of said primary radiator,

L_h: the axial length between said apex of the horn and said aperture,

L_s: the length between said aperture and said sub-reflector's bottom surface,

the improvement comprising:

the value of said t parameter being less than 0.3 at the lowest usable frequency of said antenna; and

the phase center of said primary radiator being substantially coincident with the focal point of said sub-reflector at a low frequency within said usable frequency band.

4,356,495

CORRUGATED ANTENNA FEEDHORN WITH ELLIPTICAL APERTURE

Günter Mörz, Ludwigsburg, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 29, 1980, Ser. No. 191,745

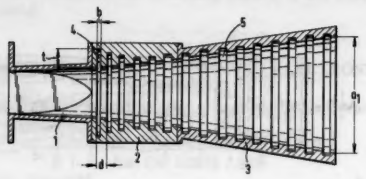
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1979, 2939562

Int. Cl.³ H01Q *13/02*

U.S. Cl. 343—786 **1 Claim**

1. In an antenna feedhorn including a transition waveguide for matching the cross section of the feeder line to the cross section of a following hybrid mode exciting section which in turn is followed by a horn section having an elliptical aperture, said hybrid mode exciting section and said horn section each being provided with a corrugated structure; the improvement wherein said hybrid mode exciting section has a circular cross

section, and said horn section has a cross section which steadily and smoothly widens from said circular cross section of said



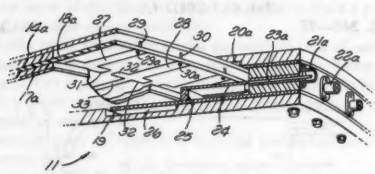
hybrid mode exciting section to the elliptical cross section of said aperture.

4,356,496

LOOP-COUPLER COMMUTATING FEED FOR SCANNING A CIRCULAR ARRAY ANTENNA

Ronald I. Wolfson, 10966 Beckford Ave., Northridge, Calif. 91326, and Ching-Fai Cho, 13083 Rajah St., Sylmar, Calif. 91342

Filed Feb. 4, 1981, Ser. No. 231,383
Int. Cl.³ H01Q *3/24, 3/32*
U.S. Cl. 343—854 **7 Claims**



1. A loop coupler commutating feed for a scanning circular array, comprising:

a stator assembly having a conductive body member in the general shape of an annulus having a cavity therein such that the cross-section of said annulus is generally U-shaped opening radially inward, said stator assembly also comprising a plurality of circumferentially distributed stator loops each radially elongated within said cavity, each of said stator loops having its elongated leg current paths in a radially extending plane normal to the plane of said annulus;

a rotor assembly including a conductive disc rotatable about its center, said center being substantially coincident with the geometric center of said annulus, said rotor assembly also including a plurality of rotor loops circumferentially spaced about an arcuate portion of said disc, said rotor loops also being radially elongated and each having its elongated leg current paths in radially extending planes normal to the plane of said disc, the plane of said disc being substantially parallel to a plane through said annulus normal to the axis of said rotor and through the center of said annulus, said disc extending radially into said cavity such that said rotor loops couple to an arc of said stator loops in juxtaposition with said rotor loops over said arcuate portion of said disc, said coupling effecting energy transfer between said rotor and stator loops to a changing arcuate portion of said stator loops as said disc is rotated;

first means within said rotor assembly comprising a dielectric substrate spaced parallel to said conductive disc and rotatable with and about said conductive disc center, said substrate and said disc being substantially congruent;

second means comprising a feed network having a conductor trace on the surface of said substrate discretely connected to each of said rotor loops;

third means comprising a second conductive disc spaced from and parallel to said dielectric substrate on the side thereof opposite said conductive disc, said discs and said conductor traces on said substrate surface forming a multiple stripline arrangement;

fourth means comprising a conductive trace extension of each of said traces on said dielectric substrate, said conductive extensions extending beyond the radial extremity of said second conductive disc to form legs of said rotor loops;

fifth means comprising a conductive connection between the radially outward extremity of each of said conductive extensions and said conductive disc, said conductive extensions facing said stator loops;

sixth means for providing a feed connection between said conductive traces within said stripline and at least one common port;

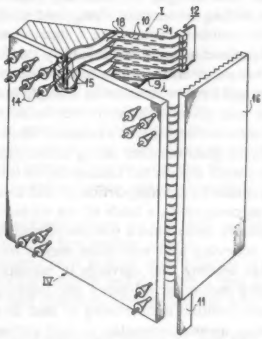
and seventh means comprising a plurality of stationary second ports each discretely connected to a corresponding one of said stator loops.

4,356,497

NON-DISPERSIVE ARRAY ANTENNA AND ELECTRONICALLY SCANNING ANTENNA COMPRISING SAME

Michel Dudome, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Sep. 4, 1981, Ser. No. 299,646
Claims priority, application France, Sep. 9, 1980, 80 19413
Int. Cl.³ H01Q *15/02*
U.S. Cl. 343—854 **8 Claims**



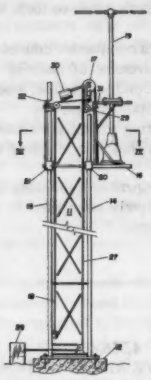
1. In a non-dispersive array antenna, comprising a dispersive primary array constituted of a superimposition of primary, monodimensional arrays, each fed via a phase shifter for allowing electronic scanning; a secondary array in the form of a panel having elementary sources on its inner and outer faces with passive phase shifters introduced between the two faces, each such phase shifter aligned with an inner and outer element, said secondary array including an acute angle α with said primary array; and an absorbent panel closing the dihedron defined between the two arrays: the improvements comprising parallel planes arranged between said primary and secondary array so as to provide ducts for guiding the propagation of waves between corresponding radiating elements belonging to said primary and secondary arrays respectively, said array antenna being thus made of piling up of a plurality of non-dispersive, monodimensional antennas, in which the propagation between the primary array and the secondary array is guided.

4,356,498

TOWER ASSEMBLY

Bernard R. Pollard, 5603 Alan St., Aliquippa, Pa. 15001

Filed May 4, 1981, Ser. No. 259,807
Int. Cl.³ H01Q *1/10*
U.S. Cl. 343—890 **2 Claims**



1. A tower for positioning an antenna comprising:

a. a base for supporting said tower;

b. said tower being connected to said base and having at least three upright members, a top portion, and a bottom portion;

c. carriage means for supporting an antenna and surrounding said upright members, said carriage means flexibly connected to said upright members by glide members that facilitate sliding movement along said upright members, said glide members comprising a spacer having a shaped interior surface adapted to generally conform at least a portion of said interior surface to the shape of said upright members and held in position by a single holding member whereby said glide member is free to rotate about said holding member and thereby enhance flexibility of movement of said glide member along said upright members;

d. latching means connected to said tower for securing said carriage means to the top portion of said tower, said latching means comprising a latch of the rocker arm type that automatically locks onto a portion of said carriage means thereby relieving said activation means from forces created from holding said carriage in position, and further comprising means for releasing said latching means from the locked position upon raising of said carriage means;

e. positioning means connected to said carriage means for raising and lowering said carriage along said tower; and

f. activation means connected to said positioning means, said activation means activation means being located at a position outside of an area defined by said upright members.

4,356,499

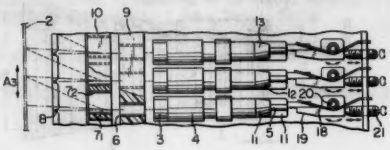
INK-JET RECORDING DEVICE

Yutaka Kodama, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Nov. 19, 1980, Ser. No. 208,301
Claims priority, application Japan, Nov. 28, 1979, 54/153839
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—75 **12 Claims**

1. An ink-jet recording device of the type in which ink under pressure is supplied to a plurality of ink emission heads which in turn emit ink jets modulated by periodic pressure variations of a piezoelectric element associated therewith for recording, characterized in that

the ink under pressure is supplied from a single source of pressurized ink to an ink manifold with one inlet port and a plurality of outlet ports; and



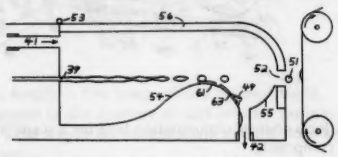
one end of a flexible pipe is connected to each of said outlet ports while the other end thereof is connected to an ink emission head, whereby the ink under pressure is supplied to said ink emission head from said ink manifold.

4,356,500

DROPLET CONTROL ASPECTS—INK EVAPORATION REDUCTION; LOW VOLTAGE CONTACT ANGLE CONTROL DEVICE; DROPLET TRAJECTORY RELEASE MODES; USES FOR METALLIC INK DROPS IN CIRCUIT WIRING AND PRESS PRINTING

Ronald E. Graf, Rte. 3, Box 520, Crozet, Va. 22932

Division of Ser. No. 100,953, Dec. 6, 1979, Pat. No. 4,283,730.
This application Apr. 20, 1981, Ser. No. 255,708
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—75 **12 Claims**



1. A device which comprises a structure which produces at least one stream of ink, which stream eventually breaks into separate droplets of ink,

the ink of said at least one stream of ink contacting a surface of at least one solid containing a number of special portions of the surface, each one of said number of special portions of the surface having a respective associated geometrical surface at some small depth interior to and roughly locally parallel to the special portion of the surface with which it is associated, and each said associated geometrical surface being controllable to exist at any of at least two voltage states at any instant during normal operation, assuming that appropriate control signals are stimulated during an interval shortly preceding and including that instant,

each droplet contacting at least one of said number of special portions of said surface, the voltage difference between said droplet and said geometrical surface associated with any one of said special portions of surface contacted by said droplet altering the range of contact angles of said droplet with said special portion of surface contacted depending on said voltage difference, each said range of contact angles in turn determining in part the range of acceleration force resultants during contact applied to a droplet during contact with said special portion of surface,

the net history of acceleration applied during contact with said surface of at least one solid in turn determining whether or not a particular droplet will be selected, i.e. will contact, solidify, and substantially remain, at least until removed therefrom, on an output receiving means,

which means may be at least one anodized metal sheet conveyed past the said device,

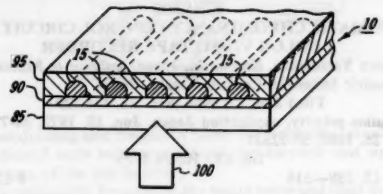
the ink of said device consisting mainly, if not entirely, of metal.

4,356,501

INTEGRATED SILICON NIB FOR AN ELECTROSTATIC PRINTER

Ram S. Ronen, Placentia, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 19, 1979, Ser. No. 95,872
Int. Cl.³ G01D *15/06*
U.S. Cl. 346—155 **3 Claims**



1. A stylus device for recording discrete electrostatic charges on a dielectric media moved in a plane past a surface of said device, said stylus device comprising:

a rigid substrate;

a first layer of dielectric material overlying at least a portion of a surface of said substrate;

a stylus array positioned at the exposed surface of said first layer of dielectric material, said stylus array being comprised of a plurality of electrically conductive stylii lying in a plane substantially orthogonal to said plane of movement of said media;

a second layer of dielectric material overlying said stylus array; and

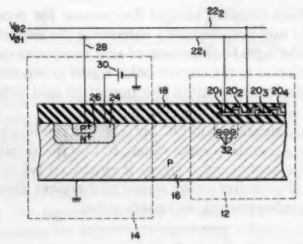
driver means coupled to each of said stylii for applying a voltage to selected ones of said stylii whereby electrostatic charges are recorded on portions of said media.

4,356,502

PROTECTION CIRCUIT FOR A SEMICONDUCTOR DEVICE

Tetsuo Yamada, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Dec. 14, 1979, Ser. No. 103,446
Claims priority, application Japan, Jan. 31, 1979, 54-9191
Int. Cl.³ H01L *29/90*
U.S. Cl. 357—13 **3 Claims**



1. A protection circuit for a semiconductor device formed in a common semiconductor chip with said circuit comprising:

a semiconductor substrate of a first conductivity type;

a first region of a second conductivity type formed in said semiconductor substrate;

a second region of said first conductivity type formed in said first region;

means for applying a constant potential to said first region to reverse bias a PN junction formed between said semiconductor substrate and said first region and to reverse bias a PN junction formed between said first and second regions; and

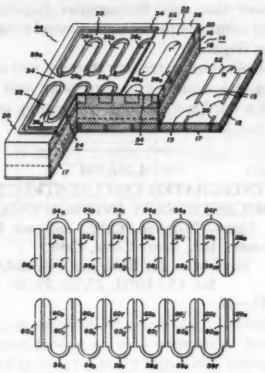
means for electrically connecting said second region and said semiconductor device to be protected.

4,356,503

LATCHING TRANSISTOR

Peter O. Shafer, and E. Duane Wolley, both of Auburn, N.Y., assignors to General Electric Company, Syracuse, N.Y.

Continuation of Ser. No. 915,563, Jun. 14, 1978, abandoned.
This application Feb. 28, 1980, Ser. No. 125,413
Int. Cl.³ H01L *29/74*
U.S. Cl. 357—38 **2 Claims**



1. A semiconductor switching device of the four-vertically-superimposed-layer gate-turn-off type having controllable emitter shorting and adapted to be turned both on and off by gate signals comprising:

a semiconductor body having first and second vertically separated and overlapping opposite major surfaces;

a first emitter region of a first conductivity type in said first surface having two spaced comb-shaped sections each including a relatively wide spine from which extends longitudinally and parallel to said first major surface a set of relatively narrow fingers with the fingers of each set extending toward but being spaced from the fingers of the other set;

first emitter electrode means on said first surface in ohmic contact with said first emitter region;

a first base region of a second conductivity type adjacent said first emitter region and forming a first p-n junction therewith, said junction terminating on said first major surface;

comb-shaped gate electrode means on said first major surface interdigitated with said first emitter region and in ohmic contact with said first base region, said gate electrode means being adjacent to but laterally spaced apart from said first p-n junction;

a second base region of said first conductivity type adjacent and vertically beneath said first base region and forming a second p-n junction therewith;

a control region of said first conductivity type adjacent and vertically beneath said second base region and spaced from the first base region by said second base region, said control region having a higher impurity concentration than said second base region;

a selectively shorted second emitter region of said second conductivity type adjacent said control region in vertically underlying relation with said first emitter region;

said second emitter region being situated in vertically underlying relation with essentially only that part of the first emitter region other than the spine portions of the first emitter region;

said second emitter region including a central spine region vertically underlying essentially the space between the two sets of first emitter fingers and further including a plurality of spaced second emitter fingers extending from said central spine region in vertically underlying relation with essentially only a part of the first major surface not occupied by the spine portion of the first emitter;

said second emitter fingers each including a projection extending from its end into vertical alignment with a spine portion of the first emitter region;

said second emitter region further having longitudinally extending apertures therein constituted by the spaces between the second emitter fingers, which apertures are narrower than said first emitter fingers and vertically aligned with only the laterally central portions of said first emitter fingers;

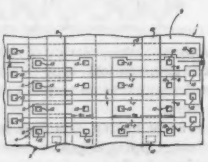
said control region extending through said apertures to said second major surface to form with said second emitter region a third p-n junction terminating on second major surface.

4,356,504

MOS INTEGRATED CIRCUIT STRUCTURE FOR DISCRETIONARY INTERCONNECTION

Orhan N. Tozun, Milpitas, Calif., assignor to International Microcircuits, Inc., Santa Clara, Calif.

Filed Mar. 28, 1980, Ser. No. 134,968
Int. Cl.³ H01L 27/02, 29/34
U.S. Cl. 357—42 **10 Claims**



1. At least two MOS transistors on a common substrate of a first conductivity type, each transistor comprising source and drain regions of a second conductivity type opposite said first conductivity type and a gate;

at least one of said source and drain regions being common to each of said two transistors;

means for contacting each of said source and drain regions at two locations so that said regions can act as both source or drain regions and as interconnection underpasses; and

metallized connection means for supplying current to said MOS transistors, said connection means passing over each of said source and drain regions and over said gate, and said connection means lying between said contact means for each of said source and said drain regions.

4,356,505

CONDUCTIVE ADHESIVE SYSTEM INCLUDING A CONDUCTIVITY ENHANCER

Andrew J. Lovinger, New York, N.Y., and Louis H. Sharpe, Morris Township, Morris County, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 931,159, Aug. 4, 1978, abandoned. This application Nov. 5, 1979, Ser. No. 91,453
Int. Cl.³ H01L 23/28
U.S. Cl. 357—72 **4 Claims**

1. A method for bonding one electrical assembly or element to another or to a support member with an epoxy material, comprising the steps of applying an uncured epoxy material comprising a conductivity component consisting essentially of metal powder or flakes, of particle size typically between 0.5μm and 50μm, the weight of the conductivity component being between about 25% and about 85% by weight of the epoxy material, and a dispersing component, to at least one surface, applying the surfaces to be bonded together, and curing the epoxy material, the method characterized in that the epoxy material contains 0.1% to 10%, by weight, based on the weight of the epoxy resin, of a conductivity enhancer selected from the group consisting of

$$HO—CH_2—[CH_2—O—CH_2]_n—CH_2—OH$$

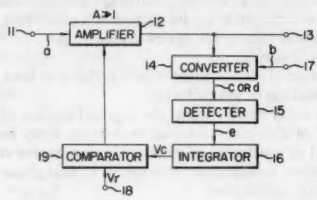
n being within the range of 2–10.

4,356,506

AUTOMATIC CHROMINANCE CONTROL CIRCUIT FOR A COLOR VIDEO TAPE RECORDER

Chojuro Yamamitsu, Kawanishi, Japan, assignor to Matsushita Electric Industrial Co. Ltd., Osaka, Japan

Filed Jun. 12, 1980, Ser. No. 158,729
Claims priority, application Japan, Jun. 18, 1979, 54-77415; Jun. 25, 1980, 55-22537
Int. Cl.³ H04N 5/79
U.S. Cl. 358—316 **8 Claims**



1. A color video signal recording and reproducing apparatus of the type in which the luminance signal and the composite carrier color signal, including a carrier color signal component and a color burst signal component, are separated from the color video signal; the separated composite carrier color signal and the separated luminance signal are processed for recording on a recording medium by a transducer; and the transmission circuit for coupling the separated composite carrier color signal to the transducer includes a variable gain control circuit responsive to a gain control signal for providing an optimum recording current at a maximum amplitude of the composite carrier color signal, said apparatus comprising:

first means for amplitude detecting the composite carrier color signal;

second means coupled to said first means for modifying the output of said first means by enhancing the amplitude of said color burst signal component of said composite carrier color signal relative to the carrier color signal component thereof;

third means for integrating the output of said first means to provide a varying DC voltage; and

means for comparing said DC voltage to a reference voltage to provide said grain control signal, so that the amplitude of the composite carrier color signal is enhanced when the amplitude of the carrier color signal component thereof is less than a predetermined maximum value.

4,356,507

METHOD AND APPARATUS FOR DIGITAL TELEVISION ERROR CORRECTION WITHOUT OVERHEAD BITS

Abraham A. Goldberg, and John P. Rossi, both of Stamford, Conn., assignors to CBS Inc., New York, N.Y.

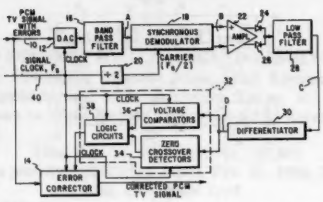
Filed Dec. 29, 1980, Ser. No. 220,864
Int. Cl.³ H04N 5/44
U.S. Cl. 358—13 **13 Claims**

1. A method of detecting and correcting bit errors contained

in a PCM-encoded digital television signal encoded at a sampling frequency F_s, comprising the steps of:

converting said digital television signal to an analog television signal;

band-pass filtering said analog signal at a center response frequency of substantially $F_s/2$ for producing responsively to bit errors frequency bursts of differing levels according to the significance of the bit in error;



demodulating said frequency bursts for producing envelopes thereof each representative of the location and significance of the bits in error;

determining the location of the bits in error and their significance; and

correcting said bit errors by inverting the bits in said digital television signal that were found to be in error.

4,356,508

BRIGHTNESS ADJUSTING CIRCUIT FOR A CATHODE RAY TUBE

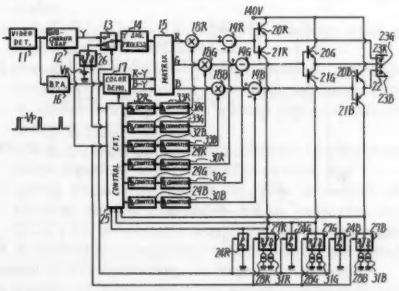
Takashi Okada, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jun. 27, 1981, Ser. No. 228,977

Claims priority, application Japan, Jan. 23, 1980, 55-6667

Int. Cl.³ H04N 9/535

U.S. Cl. 358—29 **20 Claims**



1. An automatic brightness adjusting circuit for a cathode ray tube having at least one electrode normally supplied with a video signal, and comprising: a video signal source from which said video signal is derived; a reference signal source for supplying a reference signal; signal processing means between said video signal source and said cathode ray tube for normally processing the signals provided by said video signal source; switching means for selectively supplying a signal provided by said video signal source or said first reference signal to said signal processing means, said switching means supplying said reference signal to said signal processing means during a brightness adjusting period; control signal generating means connected to said signal processing means for supplying the latter with an adjustable control signal the level of which varies gradually; means connected to said cathode ray tube for sensing the signal level at said at least one electrode; and control means responsive to said sensed signal level for stopping said control signal generating means from varying the level of said control signal and for actuating said switching means to supply said signal provided by said video signal source to said signal processing means when the sensed signal level at said at least one electrode exceeds a predetermined value.

4,356,509

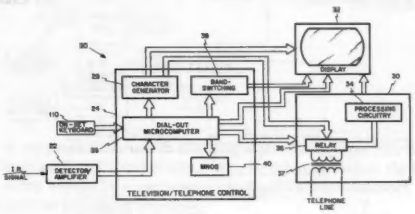
MICROCOMPUTER-CONTROLLED TELEVISION/TELEPHONE SYSTEM AND METHOD THEREFORE

Peter C. Skerlos, Arlington Heights; Paul A. Snopko, Chicago; Frank C. Templin, Arlington Heights, and Thomas J. Zato, Palatine, all of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Mar. 12, 1981, Ser. No. 243,010

Int. Cl.³ H04N 5/00

U.S. Cl. 358—85 **32 Claims**



1. In a television receiver for receiving a transmitted composite video signal having a video component and an audio component and having a tuner for selectively tuning said television receiver from a currently tuned channel to a desired channel, said television receiver including a video display and audio signal processing circuitry including audio amplifier-speaker means, a system for selectively operating said television receiver in a television mode wherein said received video signals are presented on said video display and said received audio signals are provided to said audio signal processing circuitry and said audio amplifier-speaker means, and in a telephone mode wherein audio communication by means of a telephone coupled to said television receiver may be initiated or responded to with the audio signals transmitted by said telephone coupled to said audio signal processing circuitry and audio amplifier-speaker means and to microphone means for sensing acoustic signals during a telephone conversation comprising:

remotely located control means having a plurality of selectable keys for generating binary signals representing channel numbers and alpha-numeric telephone number characters;

mode selection means coupled to said remote control means for generating a modulated signal, said modulated signal representing the telephone mode of operation of said television receiver;

microcomputer means coupled to said remotely located control means and said mode selection means for receiving said binary signals and said modulated signal and for generating a plurality of binary addresses for outputting a plurality of digital dialing words corresponding to alpha-numeric telephone number characters and a telephone switch signal, respectively, or for generating a plurality of binary addresses for outputting a plurality of digital tune words corresponding to a selected channel number from a memory matrix containing a plurality of said digital dialing and digital tune words to said tuner in tuning from a currently tuned channel to a desired channel when said modulated signal is not received; and

switching circuit means coupled to said microcomputer means for receiving said telephone switch signal and said

digital dialing words and to said audio amplifier-speaker means, said microphone means and said telephone for providing said digital dialing words to said telephone following the receipt of said telephone switch signal for initiating a telephone call and coupled to said television receiver audio signal processing circuitry for answering a telephone call and for carrying on audio communication on said telephone by means of said television receiver.

4,356,510
TELEVISION SOUND MULTIPLEX SIGNAL RECEIVING DEVICE

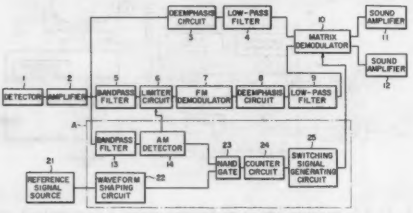
Koichi Nakayama, Hatoyama, Japan, assignor to Toko Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 13, 1979, Ser. No. 103,559

Claims priority, application Japan, Dec. 14, 1978, 53-155520; Dec. 14, 1978, 53-155521; Mar. 8, 1979, 54-29629[U]

Int. Cl.³ H04N 5/60

U.S. Cl. 358—143 **11 Claims**



1. A television sound multiplex broadcast signal receiving device comprising:

(a) means for detecting the arrival of a control subcarrier signal which has been amplitude modulated by a control signal;

(b) means for detecting said control signal amplitude-modulating said control sub-carrier signal;

(c) a counter circuit and a means for supplying a reference signal to said counter circuit at time intervals dependent on the frequency of said control signal; and

(d) means for determining whether a television sound broadcast is a stereophonic broadcast, a different program broadcast or monaural broadcast depending on the presence or absence of a signal from said means for detecting the arrival of a control sub-carrier signal and a signal from said counter circuit.

4,356,511
DIGITAL SOFT-EDGE VIDEO SPECIAL EFFECTS GENERATOR

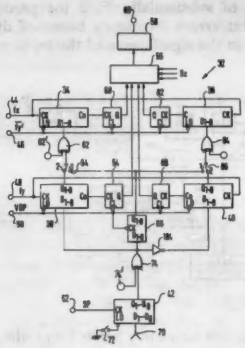
Katsuhito Tsujimura, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 908,769, May 23, 1978, abandoned. This application Jul. 9, 1980, Ser. No. 166,976

Int. Cl.³ H04N 5/22

U.S. Cl. 358—181 **11 Claims**

1. A digital soft-edge circuit for a special effects generator, including means for generating a switching signal for selecting respective portions of at least two input video signals under the control of said switching signal to produce, at an output, a single composite video signal which contains a composite of selected portions of said at least two video input signals with a soft-edged boundary region therebetween, said soft-edge circuit comprising: means responsive to said switching signal for defining at least one time interval corresponding to the width of said soft-edged boundary region and providing at least one boundary signal corresponding to said boundary region; pulse generating means responsive to said at least one boundary signal for generating a series of pulses of progressively changing mark-to-space ratio during said at least one time interval; means for forming a composite switching signal of said switching signal and said series of pulses of progressively changing mark-to-space ratio; and means responsive to said composite switching signal to switch between said at least two video



input signals such that said at least two video input signals are alternately applied to said output during said at least one time interval in accordance with the progressively changing mark-to-space ratio of said pulses to produce said soft-edged boundary region.

4,356,512
TELEVISION KEYING CIRCUIT

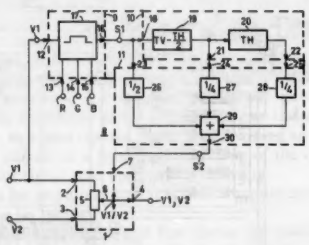
Klaas H. J. Robers, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 7, 1980, Ser. No. 137,867

Claims priority, application Netherlands, Apr. 25, 1979, 7903241

Int. Cl.³ H04N 5/22

U.S. Cl. 358—183 **9 Claims**



1. A television keying circuit, for switching between two video signals in which a resultant interlaced picture exhibits substantially no flicker, having a keying generator and a video signal switching device, said video signal switching device including a first and a second input for receiving a first and a second video signal, respectively, and an output for supplying one of the two video signals or a signal combination of the first and the second video signal, and a third input for receiving a modified keying signal for the control thereof, and said keying generator including one or more inputs, for receiving the first, the second and a third signal, and an output for supplying the modified keying signal, characterized in that the keying generator comprises a circuit coupled to said keying generator input, or inputs for generating a keying signal, a signal delay circuit having an input and two outputs exhibiting time delays equal to a television field period minus and plus half a line period, respectively, the input of the signal delay circuit being connected to the output of said circuit for generating said keying

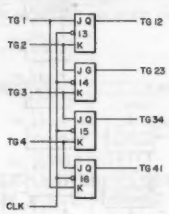
signal, and a signal combining circuit having inputs to which the input and two outputs of the signal delay circuit are connected and an output which constitutes the modified keying signal output of the keying generator.

4,356,513

CCD SCANNER WITH IMPROVED RESOLUTION

Norihiko Yoshimura; Masaaki Niiho; Shoji Kamasako, all of Tsurugashima, and Hideyuki Ishiai, Tokyo, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 24, 1981, Ser. No. 237,811
Claims priority, application Japan, Feb. 26, 1980, 55-23126
Int. Cl.³ H04N *3/14*
U.S. Cl. 358—213 6 Claims



1. A video signal composing circuit for an optical reading device for reading patterns of characters and figures with a plurality of scanned CCD's arranged in a line parallel to a reading surface, comprising:

a plurality of switch groups for setting corresponding output codes;

counter circuit means for counting scanning clock pulses supplied to said CCD's;

a plurality of comparison circuits operatively coupled to said counter circuit means for comparing said output codes set by said switch groups with a count output of said counter circuit means;

flip-flop circuits having inputs coupled to output coincidence signals of said comparison circuits; and

a gating circuit operating in response to outputs of said flip-flop circuits and video signals outputted by said CCD's for producing a single composite video signal.

3. A method for composing video signals from a plurality of scanned CCD's comprising the steps of providing:

a plurality of switch groups for setting corresponding output codes;

counter circuit means for counting scanning clock pulses supplied to said CCD's;

a plurality of comparison circuits operatively coupled to said counter circuit means for comparing said output codes set by said switch groups with a count output of said counter circuit means;

flip-flop circuits having inputs coupled to output coincidence signals of said comparison circuits; and

a gating circuit operatively in response to outputs of said flip-flop circuits and video signals outputted by said CCD's for producing a single composite video signal;

coarsely mechanically aligning said CCD's;

providing a video signal composing pattern comprising alternating patterns of vertical and horizontal stripes;

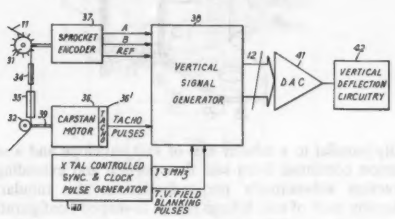
setting said switch means such that said composite video signal includes no overlap of video signals from adjacent CCD's.

4,356,514

APPARATUS FOR USE IN SCANNING A CINEMATOGRAPH FILM

Andrew S. Armstrong, Ilford, and Martin R. Sach, Tewin Wood, both of England, assignors to Transcan Video Limited, London, England

Filed Oct. 6, 1980, Ser. No. 194,318
Claims priority, application United Kingdom, Oct. 8, 1979, 7934819
Int. Cl.³ H04N *3/36*
U.S. Cl. 358—214 9 Claims



1. Apparatus for use in scanning a cinematograph film from which a television video signal is to be produced while the film is being moved in a continuous manner in a film transport, the apparatus including

signal generating means for generating a rate signal representing the rate of movement of a cinematograph film in the transport, a direction signal representing the direction of movement of the film, and a position signal representing the position of a predetermined point along the length of each film frame during the time in which the said point moves from a reference position in a film scanning region to a position reached when the predetermined point of the next film frame entering the scanning region arrives at the reference point,

raster reference means for producing a raster reference signal having a value representative of the rate of increase of the vertical coordinate of a scanning raster of the dimensions required for scanning a frame of the film in the absence of movement of the film, and

signal combining means connected to the signal generating means and to the raster reference means said signal combining means being responsive to said position signal and to said raster reference signal for sampling the value of the position signal substantially at each time at which a scanning raster is to be initiated, the combining means having a raster output and being further responsive to said direction signal and to said rate signal for producing at the raster output in each interval beginning substantially at the time of a respective sampled value of the position signal and ending substantially at the time of the next sampled value thereof an output signal having a value substantially representing the said vertical coordinate of the scanning raster required for scanning a frame of the film during the said interval, the said vertical coordinate being parallel to the length of the film at least at the scanning region.

4,356,515

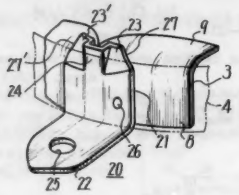
CATHODE RAY TUBE

Hiroji Sumiyoshi, Sagamihara; Mitsumasa Suzuki, Tokyo, and Hiroshi Okazaki, Matsudo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 5, 1981, Ser. No. 260,850
Claims priority, application Japan, May 14, 1980, 55/66145[U]
Int. Cl.³ H01J *29/87*; H04N *5/645*
U.S. Cl. 358—246 7 Claims

1. A cathode ray tube, comprising: a panel member with a phosphor layer coated on its inner surface; a funnel member; a

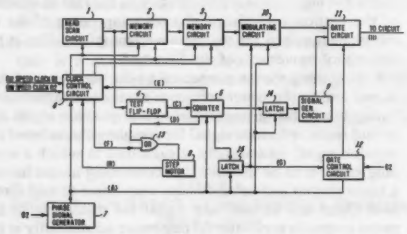
neck member having an electron gun therein, said panel member, funnel member and neck member forming an envelope of said cathode ray tube in which an image is formed on said phosphor layer by an electron beam emitted from said electron gun; fittings respectively located at corners of said panel member; and a tension band wrapped on said panel member on the outside of said fittings and then tightened to said panel member; each of said fittings consisting of a first portion substantially parallel to a tubular axis of said envelope and a second portion continued from said first portion and extending in a direction substantially perpendicular to the tubular axis whereby each of said fittings has an L-shaped configuration in cross-section, said first portion having at its outer end portion curved surfaces which conform with a peripheral wall surface of said envelope and has a center rib portion between said curved surfaces, said center rib portion having a surface substantially parallel to the tubular axis of said envelope.



4,356,516
TRANSMITTER FOR FACSIMILE

Kenji Koguchi, Tokyo, Japan, assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 17, 1981, Ser. No. 235,410
Claims priority, application Japan, Feb. 15, 1980, 55/17136[U]
Int. Cl.³ H04N *1/36*
U.S. Cl. 358—288 **8 Claims**

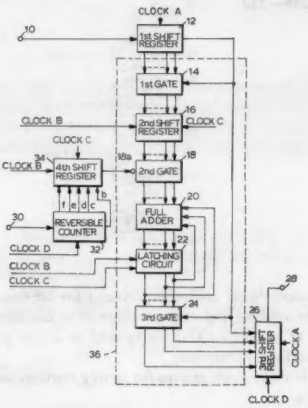


1. A facsimile system which allows faster scanning and transmission of information on a document by skipping over blank areas on said document and comprises a phase signal generating circuit (7) for generating a phase signal, a reading scanning circuit (1) for reading an original document, memory circuits (2, 3) for storing an image signal for one line, a detecting circuit (4) for testing whether or not the image signals for one line are all white signals, a counting circuit (5) for counting signals being generated by the detecting circuit, a scanning mechanism (8) for performing skips by one line on the original document, a clock controlling circuit (6) for controlling the reading scanning circuit (1), the memory circuits (2, 3) and the sub-scanning circuit (8), an oscillator circuit (9) being controlled by the counted value of the counting circuit (5), and a gate controlling circuit (12) being controlled by the count value in said counter circuit, wherein the improvement is characterized by the content of the image information having been obtained by the prior scanning of one line is sequentially tested by the detecting circuit (4), the scanning mechanism being advanced by one line when the information having been detected is one to be skipped, the number of lines to be consecutively skipped being counted by the counter, the phase signal and the image signal being transmitted when the counted value is 0, and the scanning controlling signal corresponding to the counted value being transmitted from the beginning of the phase when the counted value is equal to or more than 1.

4,356,517
PCM AUDIO REPRODUCING SYSTEM

Minoru Ozaki; Ken Onishi, and Kunimaro Tanaka, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 6, 1979, Ser. No. 72,847
Claims priority, application Japan, Sep. 21, 1978, 53-117221
Int. Cl.³ G11B *27/02, 5/00*
U.S. Cl. 360—13 **7 Claims**



1. A PCM audio reproducing system for reproducing an original audio signal from a record medium having recorded thereon a digitized PCM audio signal produced by subjecting said original audio signal to the pulse code modulation; said system comprising weighting means for successively changing the weight of digital signal bits comprising said digitized PCM audio signal in accordance with a command signal to thereby perform a fade-out or fade-in operation.

4,356,518
HIGH FREQUENCY DIGITAL PCM DECODING APPARATUS

Maurice G. Lemoine, and Leonard A. Pasdera, both of Redwood City, Calif., assignors to Ampex Corporation, Redwood City, Calif.

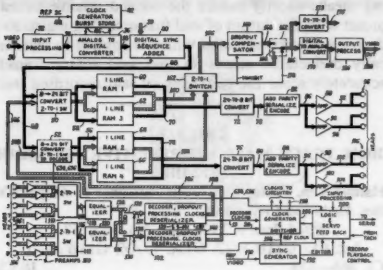
Filed Feb. 1, 1980, Ser. No. 117,881
Int. Cl.³ G11B *5/09*
U.S. Cl. 360—51 **13 Claims**

1. In a data decoder for decoding at least one stream of high predetermined frequency, serial self-clocking encoded data transmitted in successive bit cells, the stream of encoded data having logic signal transitions which can occur in a plurality of predetermined locations within each bit cell, apparatus for generating a generally continuous clock signal from said stream of encoded data, and for reclocking said stream of encoded data to minimize any mispositioning of the logic signal transitions in the bit cells, comprising:

means for producing a pulse in response to each transition that occurs in said stream of encoded data;

means responsive to said pulses for producing a continuous sine wave signal;

means converting said continuous sine wave signal to a continuous square wave signal; and



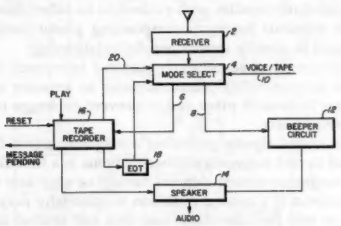
means for reclocking each transition in said stream of encoded data in response to said generated clock signal to accurately position said logic signal transition within their respective bit cells to permit accurate decoding thereof.

4,356,519

PORTABLE ANSWERING DEVICE

Lawrence A. Cogdell, Jr., 8750 E. McDowell Apt. #18, Scottsdale, Ariz. 85257

Filed Feb. 25, 1980, Ser. No. 123,929
Int. Cl.³ G11B *31/00, 5/00;* H04M *11/02*
U.S. Cl. 360—61 **2 Claims**



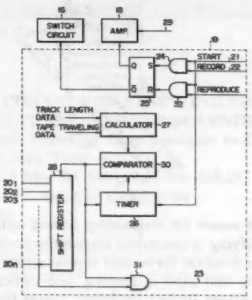
1. A portable hand held electronic voice pager, comprising:
first means for receiving an audio voice message;
second means coupled to said first means for recording the received message on magnetic tape;
third means coupled to said first means for delivering a real-time audio representation of said message; and
a plurality of controls for operating said pager, each of said plurality of controls being operable by finger movements of the hand in which said pager is held, including fourth means for activating one of said second and third means, said fourth means comprises:
generating means for generating a control signal having first and second states; and
a mode select switch coupled to said tape recorder and to said third means and responsive to said control signal for activating said tape recorder or said third means, including fifth means for indicating when a message has been recorded on said tape recorder, including switch means for resetting said fifth means, sixth means coupled to said tape recorder and to said mode select switch for detecting end of tape and forcing said mode select switch to activate said third means.

4,356,520

MAGNETIC RECORD/REPRODUCTION APPARATUS OF A STATIONARY HEAD TYPE

Tuneo Yanagida, Hino, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 10, 1980, Ser. No. 168,196
Claims priority, application Japan, Jul. 16, 1979, 54-90026
Int. Cl.³ G11B *15/12*
U.S. Cl. 360—63 **5 Claims**



1. A magnetic record/reproduction apparatus of the stationary head type comprising:
multichannel magnetic heads;
signal lines for carrying record signals and reproduction signals;
an electronic switching circuit coupled between said magnetic heads and said signal lines; and
switching control means which selectively supplies switching control signals to said electronic switching circuit for selectively connecting said magnetic heads to said signal lines, said switching control means including:
a calculator for calculating an allowable recording or reproduction time as a function of a track length and a traveling speed of the magnetic tape;
a timer for counting the recording or reproduction time and for generating a count value output signal;
a comparator coupled to said timer and to said calculator for comparing the count value of the output of said timer with said allowable time calculated by said calculator and, when said count value and said allowable time coincide with each other, said comparator producing an output signal; and
a shift register responsive to said output signal from said comparator for supplying said switching control signals to said electronic switching circuit for selectively connecting said magnetic heads to said signal lines.

4,356,521

MAGNETIC TAPE POSITION DISPLAY SYSTEM FOR A SOUND REPRODUCTION SYSTEM

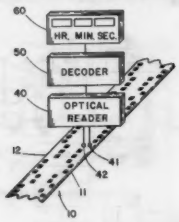
Harold N. Selim, Wichita, Kans., assignor to A. H. Hunt, III, Wichita, Kans., a part interest

Filed Oct. 18, 1979, Ser. No. 86,164
Int. Cl.³ G11B *13/04, 27/34*
U.S. Cl. 360—72.2 **1 Claim**

1. In a sound reproduction system, including means for audibly reroducing sound that has been magnetically recorded on magnetic recording tape, a tape position display system comprising:
(a) a magnetic recording tape having audio signals magnetically recorded thereon, said tape having portion-indicating groups of coded marks of different optical characteristics than other areas of said tape which successively and uniquely identify portions of tape in successive increments, said tape further having subject-matter-indicating

groups of coded marks which indentify the subject matter of the sound that has been magnetically recorded on said tape;

(b) an optical reader, said reader being sensitive to said marks and positioned to read said marks when said tape is in position for sound reproduction by said sound system; and



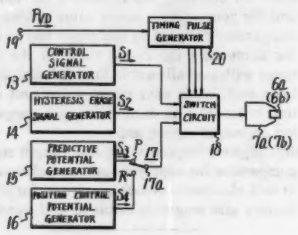
(c) decoder means for responding to said optical reader and for identifying in numerical format the portion of said tape that is in position for sound reproduction by said sound system as said tape is passing said optical reader, said decoder means further including means for identifying in alphanumeric format the subject matter of the sound that has been recorded on the portion of said tape that is in position for sound reproduction by said sound reproduction system.

4,356,522

HEAD POSITIONING SIGNAL GENERATING APPARATUS

Masayuki Takano, Hon, and Sadao Hosoi, Ebina, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 27, 1980, Ser. No. 201,051
Claims priority, application Japan, Oct. 29, 1979, 54-139666
Int. Cl.³ G11B *21/10, 21/18, 5/52*
U.S. Cl. 360—77 **12 Claims**



1. A head positioning apparatus for a helical scan tape recorder of the type including a rotary transducer adapted to reproduce signals from recording tracks on a recording medium and mounted on electrically deflectable means, comprising:

pulse signal generating means for generating pulse signals representative of the speed of movement of said recording medium;

control signal reproducing means for reproducing control signals representing positions of said recording tracks on said recording medium relative to said rotary transducer;

first counting means for counting one of up and down said pulse signals from said pulse signal generating means;

reference signal generating means for generating a reference signal in association with the rotation of said rotary transducer;

second counting means for counting one of up and down said pulse signals, with said second counting means being preset with an output of said first counting means at the occurrence of said reference signal; and

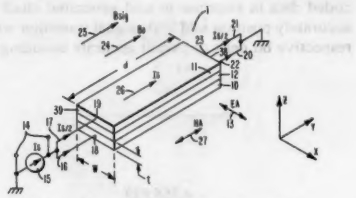
sampling means for sampling an output of said second counting means shortly before the second counting means is preset with the output of said first counting means so as to derive a control potential which is applied to said electrically deflectable means so that said rotary transducer accurately scans the beginning of said recording tracks.

4,356,523

NARROW TRACK MAGNETORESISTIVE TRANSDUCER ASSEMBLY

Nan-Hsiung Yeh, Foster City, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Jun. 9, 1980, Ser. No. 157,767
Int. Cl.³ G11B *5/12;* G11C *11/00;* G11B *5/30*
U.S. Cl. 360—113 **18 Claims**



1. A magnetoresistive transducer assembly suitable for detecting signals recorded on narrow tracks of an associated medium, comprising in combination:

two magnetostatically coupled magnetoresistive elements having corresponding dimensions and similar magnetic and electric properties, each element having a thickness significantly smaller with respect to its other dimensions, said elements having corresponding planar surfaces arranged in closely spaced parallel relationship;

a nonmagnetic nonconductive material interposed between said corresponding planar surfaces to separate said elements from each other and to prevent exchange coupling therebetween;

said recorded signals providing a magnetic signal field applied to said magnetoresistive elements in a first direction;

each magnetoresistive element having an easy axis of magnetization in a second direction substantially perpendicular to said first direction, said first and second direction defining a plane substantially parallel with said corresponding planar surfaces; and

a first means coupled to apply a D.C. sense current flow in the same direction through both said elements and substantially in parallel with the first direction.

4,356,524

MAGNETIC HEAD

Seizo Watanabe, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan

Filed Jun. 16, 1980, Ser. No. 159,827
Claims priority, application Japan, Jul. 27, 1979, 54/93900
Int. Cl.³ G11B *5/10, 5/22*
U.S. Cl. 360—129 **6 Claims**

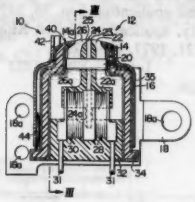
6. A magnetic head, comprising:

a magnetic head element including a core having a coil disposed thereon;

a core holder for holding the magnetic head element; said core holder including a first conductive member in contact with said magnetic head element and said first conductive member encloses an internal body portion formed of non-conductive material;

a second conductive member in contact with said first conductive member, said second conductive member provid-

ing a magnetic shield for said magnetic head element and said core holder, so that when the magnetic head element is engaged by a magnetic tape which has a conductive



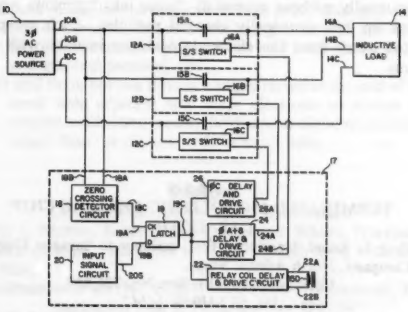
area, any static electricity developed on said magnetic tape is discharged through said first conductive member and said second conductive member.

4,356,525

METHOD AND CIRCUIT FOR CONTROLLING A HYBRID CONTACTOR

William P. Kornrumpf, Schenectady, and Joseph L. Ciccone, Albany, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 5, 1981, Ser. No. 222,412
Int. Cl.³ H02H *3/00*
U.S. Cl. 361—4 **25 Claims**



1. A method of controlling the flow of power from an AC power source to an inductive load by way of a switching circuit comprising a control circuit operably connected to a first hybrid contactor having a pair of relay contacts connected in parallel with a switching unit including at least one switching device, the AC power source having at least one output line and the inductive load having at least one input line, said first hybrid contactor switchably electrically connecting said at least one output line to said at least one input line, the steps comprising:

I. turning on the flow of power by:

(a) generating a turn-on signal,

(b) sensing a relative waveform from the output line of the AC power source,

(c) generating an indicating signal based on said relative waveform,

(d) switching the switching unit of the first hybrid contactor to an on state responsive to said turn-on signal and at a point in time determined by, and other than at a zero crossing of, the sensed relative waveform to cause a minimal DC offset current to be generated by the integrating property of the inductive load, and

(e) switching the pair of relay contacts of the first hybrid contactor to assume a closed state only after the switching unit is in an on state; and

II. turning off the flow of power by:

(a) generating a turn-off signal,

(b) switching the pair of relay contacts of the first hybrid contactor to an open state responsive to the turn-off signal, and

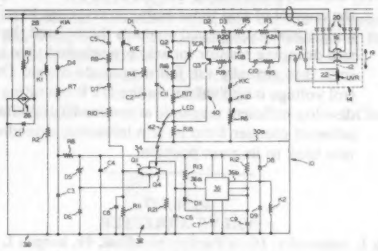
(c) switching the switching unit of the first hybrid contactor to an off state only after the pair of relay contacts are opened, to halt the flow of power from the AC power source to the inductive load.

4,356,526

CONTROL CIRCUIT FOR RESETTING DRAWOUT CIRCUIT BREAKER UVR SOLENOID

Ronald R. Russell, Plainville, Conn., assignor to General Electric Company, New York, N.Y.

Filed May 29, 1981, Ser. No. 268,317
Int. Cl.³ H02H *3/24*
U.S. Cl. 361—59 **8 Claims**



1. A circuit for controlling an undervoltage release (UVR) solenoid having a plunger mechanically operative to trip a circuit breaker in response to a system undervoltage condition, said control circuit including, in combination:

A. first and second buses having input ends coupled with an electrical distribution system for developing thereacross a DC control voltage proportional to the system voltage;

B. a first control relay having an operating coil connected between said first and second buses to be picked up by said control voltage so long as said system voltage remains above a predetermined minimum level, said first control relay further including normally open first contacts connected in said first bus downstream from its operating coil;

C. a dropping resistor connected in series with the UVR operating solenoid coil across said first and second buses downstream from said first control relay contacts, whereby the pickup of said first control relay closes its first contacts to apply said control voltage across the series combination of said dropping resistor and UVR solenoid coil pursuant to developing sufficient holding voltage across the UVR solenoid coil to magnetically hold its plunger in a reset position and thus preclude tripping of the circuit breaker;

D. a UVR solenoid drop-out delay including an energy storage capacitor connected across said first and second buses downstream from said first control relay contacts to be charged by said DC control voltage while said first control relay is picked up and its first contacts closed, whereby upon drop-out of said first control relay in response to the system voltage falling below said predetermined minimum level, said energy storage capacitor discharges through the UVR solenoid coil to develop sufficient holding voltage to hold the plunger in its reset position for a predetermined duration pending restoration of normal system voltage; and

E. a UVR solenoid resetting network including

(1) a second control relay having an operating coil and

normally open contacts connected in shunt with said dropping resistor,

(2) a timer connected with said second control relay operating coil to effect the pickup of said second control relay for a pre-selected time interval in response to an initiating signal;

(3) first means connected with said first and second buses downstream from said first control relay contacts for developing said timer initiating signal in response to the pickup of said first control relay following the dropout thereof in response to a system undervoltage condition, and

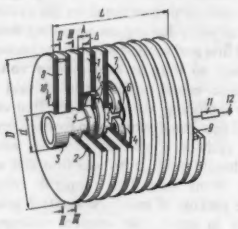
(4) second means connected with said first and second buses downstream from said first control relay contacts for developing said timer initiating signal in response to the reconnection of the UVR solenoid into said control circuit while said first control relay is picked up following the disconnection therefrom as occurring on occasion when the circuit breaker is installed in a drawout configuration,

(5) whereby, said second control relay is picked up under the control of said timer acting in response to said initiating signal to close said contacts thereof and thus shunt said dropping resistor for said pre-selected time interval such that virtually the full magnitude of said DC control voltage is applied across the UVR operating coil to develop sufficient magnetic attraction to draw the UVR solenoid plunger from its trip initiating, extended position back to its reset position.

4,356,527
VALVE ARRESTER

Erik I. Asinovsky, 16-ya Parkovaya ulitsa, 49, korpus 1, kv. 78; Anatoly A. Afanasiev, ulitsa Shosseinaya, 10, kv. 137, and Evgeny P. Pakhomov, Yakhromskaya ulitsa, 3, korpus 2, kv. 30, all of Moscow, U.S.S.R.

Filed May 21, 1981, Ser. No. 265,817
Int. Cl.³ H02H *9/04*
U.S. Cl. 361—134 **2 Claims**



1. A valve arrester comprising: arcing horns adapted to form spark gaps connected in series with one another;

at least one nonlinear resistor connected in series with said spark gaps;

arc extinction chambers in which said arcing horns are accommodated;

a single helical blade of an electric insulation material adapted to form the walls of said arc extinction chambers;

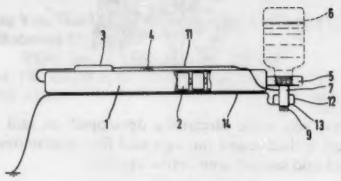
a central cylindrical member carrying said single helical blade;

said arcing horns located between the turns of said helical blade, assuming a helical space orientation, and affixed to the surface of the central cylindrical member, thereby providing for the formation of a single helical arc from the arcs produced in the spark gaps during the arrester breakdown, said arcs being joined together during their movement.

4,356,528
ATOMIZATION OF LIQUIDS

Ronald A. Coffee, Haslemere, England, assignor to Imperial Chemical Industries PLC, London, England

Continuation-in-part of Ser. No. 812,440, Jul. 1, 1977, abandoned. This application Sep. 28, 1979, Ser. No. 79,950
Claims priority, application United Kingdom, Jul. 15, 1976, 29539/76; Feb. 21, 1977, 7186/77
Int. Cl.³ B05B *5/02*
U.S. Cl. 361—226 **41 Claims**

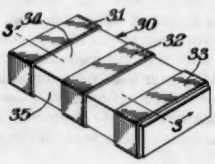


1. A process of spraying pesticides at ultra-low volume onto plants comprising supplying a liquid pesticidal composition from a source thereof through a liquid passage to a spray orifice which has an at least electrically semiconducting surface adjacent a field intensifying electrode, said surface being electrically charged and the electrode being at such a potential and so sited relative to said surface that an atomising field strength is created at said orifice so that the liquid pesticide at said orifice is drawn out preponderantly by electrostatic forces substantially without corona discharge into ligaments which break up into electrically charged particles which are projected away from the electrode and into contact with the plants.

4,356,529
TERMINATED MONOLITHIC CERAMIC CHIP CAPACITOR

Jeffrey L. Kopel, Henrietta, Tex., assignor to Sprague Electric Company, North Adams, Mass.

Filed Jan. 21, 1981, Ser. No. 226,962
Int. Cl.³ H01G *1/147*
U.S. Cl. 361—304 **7 Claims**



1. A monolithic ceramic capacitor having a rectangular chip shaped ceramic body with a plurality of sets of electrodes buried therein wherein the improvement comprises:

said sets of electrodes extending to only one particular edge of said body at separate portions thereof, respectively, a plurality of parallel spaced conductive layer strips, one part of each of said strips being bonded to and extending fully across only one major face of said chip shaped body and another part further extending over one of said particular edge portions to contact the corresponding of said electrode sets.

4,356,530

CERAMIC CAPACITOR

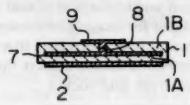
Atsushi Sato, and Hiroshi Tsuyuki, both of Nikaho, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Jul. 24, 1980, Ser. No. 171,669

Claims priority, application Japan, Dec. 15, 1979, 54/163316; Jan. 25, 1980, 55/8048

Int. Cl.³ H01G 1/14, 4/12

U.S. Cl. 361—321 5 Claims



1. A ceramic capacitor comprising:

(a) a dielectric plate having a first thin plate and a second thick plate laminated with each other, said first thin plate being too thin to support the capacitor itself, but said second thick plate being thick enough to support the capacitor, the material of the first thin plate being the same as that of the second thick plate;

(b) a first outer electrode attached on the major portion of the outer surface of said thin plate,

(c) a second inner electrode extending between said thin plate and said thick plate so that the first and second electrodes sandwiches the thin plate to provide capacitance,

(d) an external terminal attached on the outer surface of said thick plate,

(e) said thick plate having a small hole in the thickness direction of the same, and said hole being filled with a conductive means connecting electrically said inner electrode and said external terminal, and

(f) said thick portion having a single recess at the end of the small hole adjacent said inner electrode to accept the surplus conductive means, the diameter of the recess being larger than the diameter of the small hole.

4,356,531

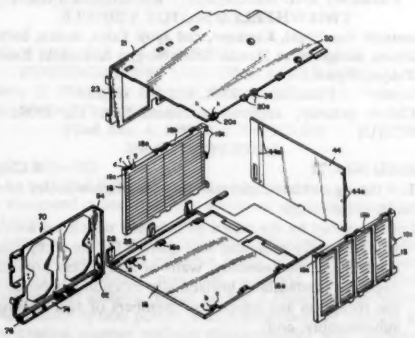
COMPUTER MOUNTING ASSEMBLY

Jerry C. Marino, Sudbury, and Lawrence J. Bibeau, Worcester, both of Mass., assignors to Data General, Inc., Westboro, Mass.

Continuation of Ser. No. 21,257, Mar. 16, 1979, abandoned. This application Feb. 5, 1981, Ser. No. 231,869

Int. Cl.³ H05K 7/20

U.S. Cl. 361—384 7 Claims



1. A computer housing receiving a plurality of computer components in precisely predetermined relation to each other, comprising orthogonally positioned intersecting top, bottom and side walls, mutually-interengaged first positioning means preformed at the intersections of the walls which, by interengagement, hold the walls in precisely predetermined relation to each other, fastening means at said intersections which secure the walls in said predetermined relation to each other as determined by said positioning means, second positioning means carried by the walls receiving said components, said second positioning means being positioned so that, when the walls are secured in said predetermined positions relative to each other as determined by the first positioning means, said components received by said second positioning means will bear a predetermined operative relation to each other, and wherein one of the computer components comprises a fan module and wherein one of the side walls is spaced inwardly from the edge of the bottom wall and that portion of the bottom wall outwardly of the side wall contains a groove slidingly receiving the fan module in parallel relation to the side walls.

4,356,532

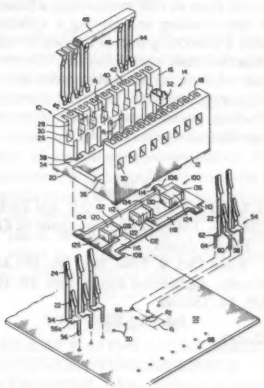
ELECTRONIC PACKAGE AND ACCESSORY COMPONENT ASSEMBLY

Charles J. Donaher, Los Altos Hills, and Gordon D. Christensen, San Jose, both of Calif., assignors to Thomas & Betts Corporation, Raritan, N.J.

Filed Jul. 18, 1980, Ser. No. 170,014

Int. Cl.³ H05K 7/10

U.S. Cl. 361—393 7 Claims



1. An electronic assembly comprising:

an electronic package having electrical contacts;

accessory component means for said package having electrical contacts for connection with said package contacts, said component means including a substrate and a component supported by said substrate, said substrate defining said component means contacts;

receptacle means having an upstanding housing defining a top opening removably receiving said package, a bottom opening removably receiving said component means and a channel extending between such top and bottom openings providing for residence of said package and said component means in vertically spaced relation in said receptacle means, said substrate being juxtaposed with a housing surface adjacent said bottom opening;

a plurality of contact elements having first portions fixedly supported in said housing, said first portions extending through said bottom opening and exteriorly thereof for engagement externally of said assembly and second portions vertically spaced from said first portions and electrically engaging said package contacts;

said substrate further including ear portions extending horizontally outwardly thereof, said contact element first portions including horizontally extending lands adjacent

said housing surface, said substrate ear portions and said lands being electrically connected adjacent said housing surface.

4,356,533

ELECTRIC FLASH DEVICE

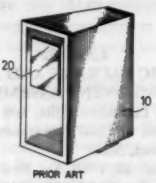
Yoshiyuki Takematsu, Tokyo, Japan, assignor to Fuji Koeki Corporation, Tokyo, Japan

Division of Ser. No. 939,704, Sep. 5, 1978, Pat. No. 4,223,372. This application Mar. 24, 1980, Ser. No. 133,120

Claims priority, application Japan, Sep. 2, 1977, 52-118271[U]; Dec. 9, 1977, 52-165292[U]

Int. Cl.³ G03B 15/02

U.S. Cl. 362—17 9 Claims



1. An electric flash device comprising a housing, a flash unit mounted in said housing and having a reflector which comprises a frame, a reflecting mirror carried by said frame, and a flash tube inserted into said reflecting mirror and having at least one pair of main current electrodes and a trigger electrode for triggering said flash tube and electrically connected to said reflecting mirror, said frame of the reflector being formed integrally with said housing.

4,356,534

LIGHT SUPPLY DEVICE FOR AN ENDOSCOPE

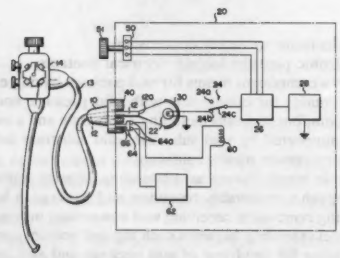
Shinichiro Hattori, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 9, 1980, Ser. No. 195,440

Claims priority, application Japan, Oct. 19, 1979, 54/134145; Oct. 19, 1979, 54/134146

Int. Cl.³ F21V 7/04

U.S. Cl. 362—32 9 Claims



1. A light supply device which includes a housing and which supplies illumination light to an endoscope having a connector connected to light guide means which transmits the illumination light to the endoscope, comprising:

light source means mounted within said housing for emitting light when energized;

power source means mounted within said housing and connected to said light source means for supplying electric power to said light source means to energize said light source means;

a socket mounted on said housing and to which said connector of said endoscope is detachably connected, said socket having an opening through which said light guide means extends when said connector is connected to said socket;

light converging means for converging said light emitted from said light source means and for causing said light from said light source means to be incident onto said light guide means when said connector of said endoscope is connected to said socket; and

light control means coupled to said light source means and including detection means for detecting the state of the connection between said connector of said endoscope and said socket; and means for causing an amount of light from said light source means to be decreased to a predetermined level when said detection means detects that said connector is disconnected from said socket.

4,356,535

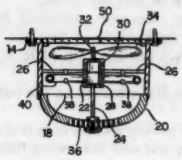
MODERN FAN DEVICE

Chung S. Chu, No. 2, La. 9, Tan Shain Rd., Pan Chiu City, Taipei, Taiwan

Filed Sep. 17, 1980, Ser. No. 187,940

Int. Cl.³ F21V 21/30

U.S. Cl. 362—35 4 Claims



1. A modern fan device comprising

a shell body;

a first motor having a turning axle and a fan leaf mounted on said turning axle of said first motor;

said first motor and said fan leaf positioned at the upper part of said shell body with said fan leaf driven by said first motor to fan air out of said shell body;

a second motor positioned at a lower part of said shell body;

a light penetrating shade covering over an opening in said shell body connected for rotation by said second motor;

and an annular illuminating lamp supported between said fan leaf and said shade.

4,356,536

FAIRING AND HEADLIGHT ASSEMBLY FOR A TWO-WHEELED MOTOR VEHICLE

Katsunori Funabashi, Kawagoe, and Jyoji Taira, Asaka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 8, 1980, Ser. No. 184,613

Claims priority, application Japan, Sep. 17, 1979, 54-126873[U]

Int. Cl.³ F21V 33/00

U.S. Cl. 362—72 4 Claims

1. A fairing and headlight assembly for a two-wheeled motor vehicle, comprising:

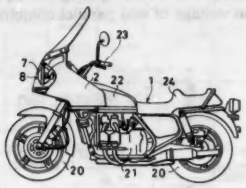
fairing carried by the motor vehicle and which has a recess in a forwardly presented face thereof for the reception of a headlight sub-assembly, walls of said recess providing opposite substantially horizontally extending grooves for the reception and support of members of said headlight sub-assembly; and

a headlight sub-assembly detachably received within said recess, said headlight sub-assembly including,

a yoke having arms which terminate in members positioned within the respective grooves of the fairing with

a tight fit and which are slidable longitudinally of said grooves; and

a threaded sleeve rigidly supported by said yoke and



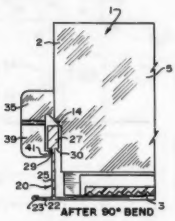
which extends through an aperture in the fairing, and which is rigidly secured therein by a threaded member received on said sleeve to secure said yoke and said headlight sub-assembly immovably within said recess.

4,356,537

LIGHTING FIXTURE RETAINER HOOK

Leo G. Stahlhut, Kirkwood, Mo.; Willard R. Garnett, Tupelo, and Lewis W. Kenyon, Baldwyn, both of Miss., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Aug. 15, 1980, Ser. No. 178,472
Int. Cl.³ F21S *1/02*
U.S. Cl. 362—148 **5 Claims**



1. In a recessed lighting fixture adapted to be laid onto horizontal flanges of inverted T-shaped rails of a grid-type ceiling, said rails having a stem with a bulb defining shoulders below the upper edge of said stem, said fixture having a housing with metal end plates, the improvement comprising a hook formed integrally with and intermediate the span of a planar section of one of said end plates and adapted to project at substantially right angles to the said planar section and to extend across and embrace said bulb, and means integral with said end plate for projecting beneath one of said shoulders wholly on one side of said stem.

4,356,538

PHOTOGRAPHIC LIGHTING APPARATUS

William T. Plummer, Concord, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

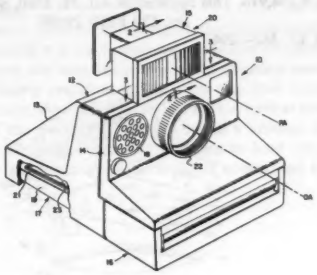
Filed Aug. 4, 1980, Ser. No. 175,060
Int. Cl.³ F21S *3/00*
U.S. Cl. 362—217 **21 Claims**

1. An artificial lighting assembly comprising:

an elongated cylindrical light source of given diameter and length;

a concave, open-ended reflector, bilaterally symmetric about a plane, said reflector being of given width and having a constant nonconic, aspheric cross-sectional shape, said aspheric shape having a radius of curvature, and hence optical power, which progressively changes in a gradual manner without discontinuities with distance along said curve, said curve being shaped so that the radius of curvature thereof increases with increasing distance from th apex thereof so as to reduce the optical power of said reflector in a predetermined manner with increasing distance along said curve; and

means for positioning said source within said reflector in a predetermined manner to project a beam of illumination of predetermined angular divergence as measured in said reflector plane of symmetry and a plane orthogonal thereto to illuminate points on any plane normal to said reflector plane of symmetry, spaced ahead of said assembly and within said beam angle of divergence and effective range, with a predetermined distribution of illumination, said reflector shape being structured to reflect light from said source in a manner whereby the illumination of said



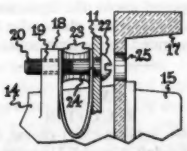
points due to said reflected light, above and below a central axis in any said normal plane defined by the intersection of said reflector plane of symmetry and any said normal plane, progressively increases in a gradual manner without discontinuities in accordance with increasing angular divergence of said beam measured away from said reflector plane of symmetry to compensate for natural losses in illumination which would otherwise be present at those same points absent said reflector; to abruptly cause a reduction in the intensity of illumination of points on any said normal plane, above and below that normal plane central axis, which points correspond to an angular divergence beyond a predetermined value.

4,356,539

VEHICLE HEADLAMP HAVING AN INTEGRAL BUGGY SPRING MOUNTING ASSEMBLY

Bruce E. Shanks, Chesterland, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 16, 1979, Ser. No. 85,368
Int. Cl.³ F21V *21/26*
U.S. Cl. 362—273 **15 Claims**



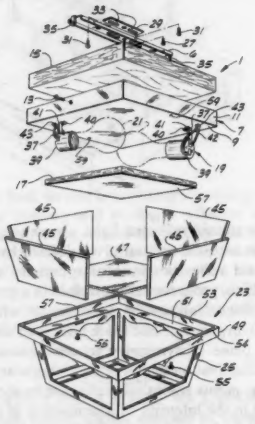
1. A vehicle headlamp assembly comprising a light source sealed within and focused relative to a sealed polymer envelope having a reflector portion and a light transmissive lens effective for producing a light beam having an axis substantially parallel to the optical axis of said headlamp, three mounting blocks integral with and mediately projecting radially outwardly from, and circumferentially spaced about the exterior surface of said envelope in a triangular configuration, said

mounting blocks having axially facing surfaces predeterminedly positioned relative to said axis of said light beam and to said envelope and defining a precisely located reference plane extending transverse to the axis of said light beam and referentially characterizing said light beam and effective for use in predeterminedly aligning said light beam relative to the vehicle by fastening said mounting blocks to respective openings in the vehicle.

4,356,540
LIGHTING FIXTURE

Charles D. Goralnik, 200 Brynwyck Pl., St. Louis County, Mo. 63141

Continuation-in-part of Ser. No. 934,461, Aug. 17, 1978, Pat. No. 4,234,916. This application Jul. 31, 1980, Ser. No. 174,272
Int. Cl.³ F21V *29/00*
U.S. Cl. 362—294 **18 Claims**



1. A lighting fixture adapted to be mounted on a ceiling by attachment to an outlet box in the ceiling, comprising a pan having a bottom and a rim engageable with the ceiling for spacing the bottom of the pan therefrom, a crossbar adapted to be attached to the bottom of the outlet box in position extending horizontally across the bottom of the box, means for fastening the rim of the pan to the crossbar, a first layer of insulation in the pan secured to the pan above the bottom thereof, a second layer of insulation secured on the underside of the bottom of the pan, means for mounting a light source on the underside of the pan below said second layer of insulation, and a diffuser having an open top adapted to be mounted on the underside of the pan around said mounting means and said light source with said second layer of insulation on the underside of the pan being disposed above the light source for thermally insulating it from the pan and the outlet box to reduce the transfer of heat generated by the light source to the outlet box.

4,356,541
RECTIFIER

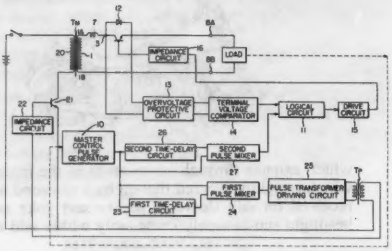
Tsuneo Ikenoue, 14-6, Ichiban-cho 1-chome, Sendai-shi, Miyagi; Shin-yng Liu, Sendai; Shuichi Umemoto, Yokohama, and Naoki Arai, Machida, all of Japan, assignors to Tsuneo Ikenoue; Tohoku Ricoh Co. Ltd.; Stanley Electric Co., Ltd. and Micron Kiki Co., Ltd., all of Tokyo, Japan

Filed Dec. 16, 1980, Ser. No. 216,923
Claims priority, application Japan, Dec. 19, 1979, 54-165011
Int. Cl.³ H02M *3/335*
U.S. Cl. 363—20 **3 Claims**

1. A rectifier for an AC input voltage, comprising:

a parallel combination circuit of a semiconductor active rectifying element having a control terminal and a diode, said active element and said diode being connected in parallel in the same conduction direction;

a terminal voltage comparator coupled to said parallel combination circuit for comparing the input voltage with the output voltage of said parallel combination; and



a pulse control circuit comprising a master control pulse generator coupled to said terminal voltage comparator, an operational circuit and a drive circuit coupled to the control terminal of said semiconductor active element for controlling the same in response to the output from said master control pulse generator.

4,356,542
DIGITAL CONTROLLER

Ronald L. Bruckner, Longwood; Ishwar S. Khamare, Fern Park; Joseph L. Voyer, Longwood; Rodney V. Hamilton, and Paul Gheorghiu, both of Orlando, all of Fla., assignors to NCR Corporation, Dayton, Ohio

Filed Mar. 11, 1981, Ser. No. 242,788
Int. Cl.³ H02M *3/335*
U.S. Cl. 363—26 **19 Claims**

1. In a power supply comprising an input circuit, an output circuit and switching means coupling the input and output circuits when enabled, means for generating pulse-width modulated control signals enabling the operation of said switching means includes:

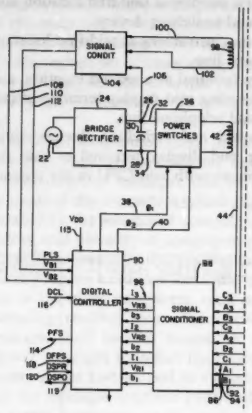
means for sampling the voltage level of said output circuit;

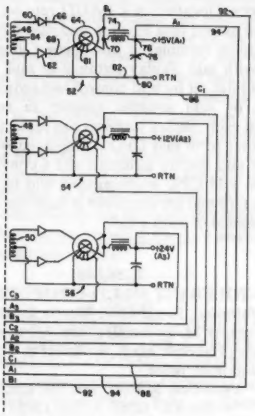
first means for generating a first digital value for each voltage sample;

second means for generating a second digital value representing the difference between succeeding first digital values;

first adding means receiving a third digital value representing the standard pulse-width modulated control signal for the required power output of the power supply, said adding means connected to said second generating means for adding said second and third digital values to output a fourth digital value;

and third means connected to said switching means and said first adding means for generating a pulse-width modulated





control signal in accordance with said fourth digital values.

4,356,543

OVERCURRENT-PROTECTED INVERTER

William R. Reynolds, c/o Electronic Systems & Components, Inc., 110 Summit Ave., Chatham, N.J. 07928

Division of Ser. No. 103,735, Dec. 14, 1979, Pat. No. 4,316,097. This application Jun. 12, 1981, Ser. No. 273,240

Int. Cl.³ H02M 3/335

U.S. Cl. 363—56 **4 Claims**

1. A foldback-characterized, overcurrent-protected inverter comprising:

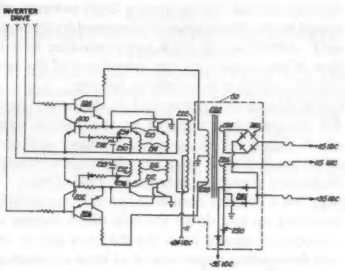
a direct current source having a current output and a current return;

a transformer having a center-tapped primary winding and a plurality of secondary windings including at least one blocking signal generating winding, direct current from the current output of the source being applied to the center tap of the primary winding;

first and second power transistor switch means each having a pair of power leads and a control input lead, one of the power leads of the first power transistor switch means being connected to one end of the primary winding, one of the power leads of the second power transistor switch means being connected to the other end of the primary winding, the other power leads of the first and second power transistor switch means being connected to the current return of the direct current source, application of complementary trigger signals to the control inputs causing complementary switching of the first and second power transistor switch means wherein the current supplied by the direct current source is chopped, and converted to alternating current by the secondary windings of the transformer;

first and second driver means responsive to an inverter drive signal to provide the trigger signals to the transistor switch means;

first and second inverter drive signal shunting transistors each connected to a respective one of the first and second driver means, the base electrodes of the shunting transistors each being responsive to at least one load current sampling resistor in electrical series relation with at least a portion of the primary winding wherein a voltage drop across the sampling resistor in response to load current through it generates a feedback signal constituted by a



base drive current to the shunting transistors to switch them to a conducting condition wherein the inverter drive signal is shunted away from the first and second driver means to preclude complementary switching of the power transistor switch means; and

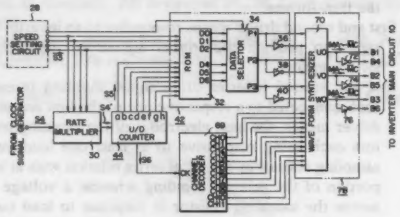
a blocking signal generating circuit including the blocking signal generating winding of the transformer, the blocking signal generating winding providing a feedback voltage applied to the base electrodes of the shunting transistors, the feedback voltage blocking and opposing the application of the base drive current to the shunting transistors to hold them in a non-conducting condition, an overload condition on one or more of the transformer secondary windings causing at least partial collapse of the feedback voltage wherein the base drive current is applied to switch on the shunting transistors to preclude complementary switching of the power transistor switch means, said sampling resistor and at least one base-emitter junction of said power transistor switch means providing a series path for said base drive current, said blocking signal generating winding providing the feedback voltage to buck the voltage drop across the sampling resistor and base-emitter junction.

4,356,544

APPARATUS FOR CONTROLLING AN INVERTER MAIN CIRCUIT

Takuo Ono, Yokohama; Sigeo Fukui, Nagoya, and Junichi Ookura, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 29, 1981, Ser. No. 268,247
Claims priority, application Japan, Jun. 5, 1980, 55-78392[U]
Int. Cl.³ H02M 7/537
U.S. Cl. 363—132 4 Claims



1. An apparatus for controlling an inverter main circuit, comprising:

an output setting circuit for generating digital signals determining the output frequency of an inverter main circuit;

a memory circuit connected to the output setting circuit for storing control signals having logic patterns which correspond to the frequencies represented by the digital signals, said control signals each corresponding to a 180°/n portion of the output voltage waveform of the inverter main circuit, where n is a positive integer;

a correcting circuit connected to the output setting circuit for generating, according to the digital signals, a first clock signal which makes the output voltage of the inverter main circuit have a predetermined relation with the frequency represented by the digital signals;

an up-down counter connected to the correcting circuit for counting up and down the first clock signals and reading the control signals from the memory circuit in ascending and descending sequences of address numbers of the memory circuit, thereby generating a second clock signal every time the counting direction is reversed;

a converter connected to the up-down counter for generating a signal in response to the second clock signal, said converter having 2n output terminals from which one signal after another is supplied; and

a waveform synthesizer circuit connected to the memory circuit and the converter for supplying to the inverter main circuit some of the control signals read from the memory circuit in a predetermined order, every time the inverter main circuit generates a 180°/n portion of the output voltage waveform and in accordance with the signals supplied one after another from the output terminals of the converter.

4,356,545

APPARATUS FOR MONITORING AND/OR CONTROLLING THE OPERATIONS OF A COMPUTER FROM A REMOTE LOCATION

Kenneth J. West, Hopkinton, Mass., assignor to Data General Corporation, Westboro, Mass.

Filed Aug. 2, 1979, Ser. No. 62,954
Int. Cl.³ G06F 3/04; H04M 11/00
U.S. Cl. 364—200 12 Claims

11. A computer system comprising:

a. a CPU at a first location,

b. a display terminal at said first location,

c. a control and switching device at said first location,

d. means connecting said CPU to said control and switching device,

e. means connecting said display terminal at said first location to said control and switching device,

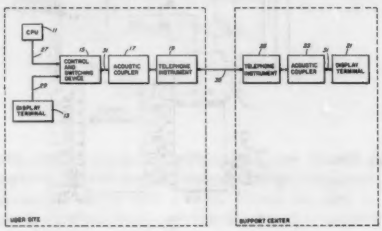
f. an acoustic coupler at said first location connected to said control and switching device,

g. a telephone instrument at said first location connected to a telephone line,

h. a display terminal at a second location, and

i. means coupling said display terminal at said second location to said telephone line,

j. said control and switching device including circuitry allowing said display terminal at said first location to communicate with said CPU in the absence of a link between said acoustic coupler and said display terminal at said second location at a BAUD rate set by said display terminal at said first location and said CPU and allowing said display terminal at said second location to operate along with said display terminal at said first location at BAUD rates set by said control and switching device and limited by said acoustic coupler in an on-line mode wherein each display terminal can input to said CPU and the output from said CPU is displayed simultaneously at both of said display terminals and a conversational mode wherein said CPU is disengaged and inputs from either display terminal are displayed at both display terminals, in the presence of such a link.

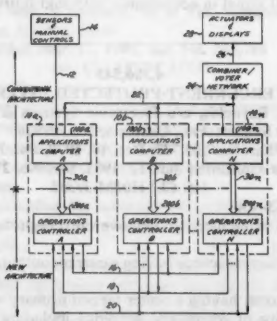


4,356,546

FAULT-TOLERANT MULTI-COMPUTER SYSTEM

Arliss E. Whiteside, Royal Oak; Morris D. Freedman, Southfield; Alexander M. Rothschild, Ann Arbor, all of Mich., and Ömür Tasar, Harvard, Mass., assignors to The Bendix Corporation, Southfield, Mich.

Filed Feb. 5, 1980, Ser. No. 118,692
Int. Cl.³ G06F 11/18, 15/16
U.S. Cl. 364—200 52 Claims



1. A fault-tolerant multi-computer system architecture, responsive to intercomputer messages and to inputs from external sources for executing a predetermined set of tasks to produce an output to at least one external device, comprising:

a plurality of computers for collectively executing the pre-

determined set of tasks in a coordinated manner to produce outputs to the at least one external device in response to the inputs from the external sources and the intercomputer messages, each of said computers having an assigned subset of the tasks which it is capable of selecting and executing in a predetermined order of priority, each task in said predetermined set of tasks being included in more than one of said assigned subset so that each task is capable of being selected and executed by more than one computer; and

a like plurality of communication links, one associated with each computer, each communication link transmitting only the intercomputer messages sent by the associated computer to all of the computers which require any message generated by the associated computer; and

wherein each of said plurality of computers comprises:

operations controller means for controlling the operation of its own computer in coordination with like operations controllers in the other computers, each operations controller including: receiver means for receiving intercomputer messages, fault handler means for checking said intercomputer messages to detect the faulty operation of any computer in the system, and to exclude from further processing the messages received from faulty computers, scheduler means responsive to the receipt of all the data variables for the execution of at least one of its assigned tasks for selecting from its assigned subset the tasks to be executed, task communicator means responsive to the task selected by the scheduler means for assembling the data variables required for the execution of the selected task and transmitter means responsive to said fault handler means, said scheduler means and said task communicator means for sending intercomputer messages to all of the computers in the system, said messages containing an identification of the faulty computers, identification of the tasks it has selected, and the values of the data variables resulting from the execution of the selected tasks required for the execution of a subsequent task; and

applications computer means for executing the tasks selected by said scheduler means using the data assembled by said task communicator means.

4,356,547

DEVICE FOR PROCESSING TELEPHONE SIGNALS, INCLUDING A PROCESSOR AND A PREPROCESSOR SHARING A COMMON MEMORY

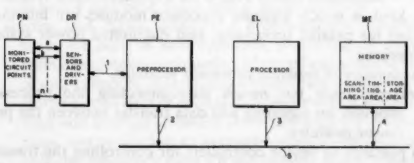
Valerio Barcaroli; Carlo DeMichelis; Giuseppe Giandonato, and Silvano Giorcelli, all of Turin, Italy, assignors to CSELT—Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Continuation-in-part of Ser. No. 891,194, Mar. 29, 1978, abandoned. This application Dec. 27, 1979, Ser. No. 107,659

Claims priority, application Italy, Mar. 31, 1977, 67702 A/77

Int. Cl.³ G06F *15/16*

U.S. Cl. 364—200 **5 Claims**



1. In a telecommunication system wherein a multiplicity of circuit points are partly monitored by sensors and partly controlled by drivers, including a processor for handling incoming signals from said sensors and causing the emission of outgoing signals to said drivers,

the combination therewith of:

a preprocessor with input connections from said sensors and output connections to said drivers;

a common memory available to said processor and to said preprocessor; and

a bus interlinking said processor, said preprocessor and said common memory;

said preprocessor comprising a microprogrammer responsive to an instruction from said processor, communicated via said bus, for carrying out a sequence of operations involving a seizure of said bus by said preprocessor for the duration of said sequence, a scanning of consecutive circuit points on the basis of address information supplied by said common memory, reception of incoming signals and emission of outgoing signals relating to points being scanned, and an evaluation of said incoming signals, said preprocessor further comprising logical circuitry for performing said evaluation by an exchange of data with said common memory through said bus, said logical circuitry including a read-only memory jointly addressable by a current-state signal from a given circuit point and a previous-state signal from said common memory for supplying integration codes determining the recognition of a definite change of state to be communicated to said processor, said microprogrammer including a microprogram memory stepped by a sequencer and a logic network inserted between said microprogram memory and said sequencer for commanding the performance of lower-priority tasks after the scanning of said circuit points and prior to release of the bus by said preprocessor.

4,356,548

PROCESS AND DATA SYSTEM USING DATA EXTENSIONS

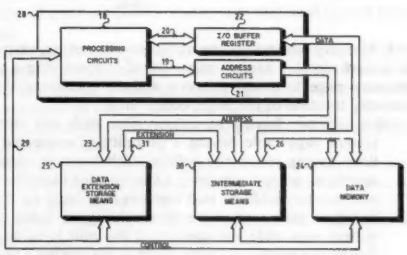
Robert J. A. Bavoux, Rueil Malmaison; Francis R. J. Lemaire, and Pierre Salkazanov, both of Plaisir, all of France, assignors to Compagnie Internationale pour l'Informatique Cii-Honeywell Bull (Societe Anonyme), Paris, France

Filed Mar. 28, 1980, Ser. No. 135,079

Claims priority, application France, Apr. 6, 1979, 79 08714

Int. Cl.³ G06F *13/00*

U.S. Cl. 364—200 **16 Claims**



1. A method of operation of a data processing system including a processor, an addressable data memory having a plurality of addresses, an addressable extension read-write memory for storing a plurality of extensions generated by said processor, and an intermediate storage means; said processor, said data memory, said extension read-write memory, and said intermediate storage means operatively interconnected by a control bus and an address bus; said processor, said data memory, and said intermediate storage means operatively interconnected by a data bus; said extension read-write memory and said intermediate storage means operatively interconnected by a extension bus; and each extension has an address within said extension read-write memory which is the same as an associated predetermined one of said addresses within said data memory, the steps comprising:

(a) storing a extension in said intermediate storage means,

said extension provided to said intermediate storage means from said processor by way of said data bus;

(b) simultaneously addressing said data memory and said extension read-write memory by placing an address signal on said address bus, and

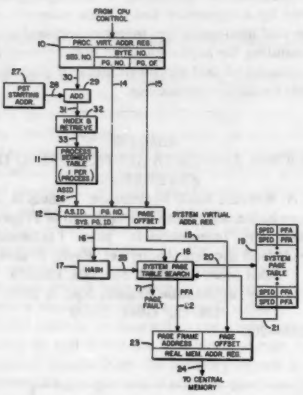
(c) writing the extension from said intermediate storge means into said extension read-write memory by way of said extension bus and at an an address determined by the address signal, while simultaneously writing an associated extended data word into said data memory at an address determined by the address signal such that said extension and said extended data word are associated by having the same address respectively within said extension read-write memory and said data memory.

4,356,549

SYSTEM PAGE TABLE APPARATUS

Richard J. Chueh, Cardiff, Calif., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Apr. 30, 1980, Ser. No. 136,731
Int. Cl.³ G06F *9/36*
U.S. Cl. 364—200 **3 Claims**



1. Memory addressing apparatus for converting, responsive to a start signal, a system page identifier specifying a virtual memory page to a real memory address specifying the real memory location of the page, comprising

(a) a memory having an output data path and storing a system page table having a plurality of sequential locations having sequential indices, each location capable of storing an entry comprising a system page identifier and a real memory address, said memory supplying on the output data path responsive to receiving an index to the system page table, the contents of the table location specified by the index, said table when in use storing a plurality of entries substantially smaller in number than the total number of table locations, each said entry being stored in one of a block of a predetermined number of contiguous locations and starting with an initial index for the system page identifier and which is a predetermined mathematical function of the system page identifier;

(b) index generator means receiving the system page identifier for generating responsive thereto an output encoding the initial index as the predetermined mathematical function of the numeric value of the system page identifier, said mathematical function comprising generation of a preliminary index to an entry in the system page table, multiplication of the preliminary index by a predetermined integer, and selection of sufficient low order digits of the product to conform the size of the result to the size of the system page table indices;

(c) entry retrieval means receiving the index generator means output encoding the initial index for, responsive to the start signal, supplying sequentially the entries within the block of locations starting at the initial index received from the index generator means, each such entry being supplied responsive to one of a series of retrieval signals; and

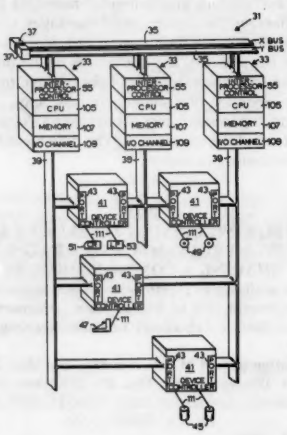
(d) comparison means receiving the system page identifier to be converted to a real memory address, for supplying a first retrieval signal to the entry retrieval means responsive to the start signal and receiving the entry retrieved responsive thereto, and for comparing the system page identifier to be converted to the system page identifier contained in the just-received entry, and responsive to equality therebetween supplying the real memory address stored in the just-received entry as the desired real memory address, and responsive to inequality supplying another retrieval signal to the entry retrieval means.

4,356,550

MULTIPROCESSOR SYSTEM

James A. Katzman, San Jose; Joel F. Bartlett, Palo Alto; Richard M. Bixler, Sunnyvale; William H. Davidow, Atherton; John A. Despotakis, Pleasanton; Peter J. Graziano; Michael D. Green, both of Los Altos; David A. Greig; Steven J. Hayashi, both of Cupertino; David R. Mackie, Ben Lomond; Dennis L. McEvoy, Scotts Valley; James G. Treybig, and Steven W. Wierenga, both of Sunnyvale, all of Calif., assignors to Tandem Computers Incorporated, Cupertino, Calif.

Division of Ser. No. 721,043, Sep. 7, 1976, Pat. No. 4,228,496.
This application May 6, 1980, Ser. No. 147,305
Int. Cl.³ G06F *11/20*
U.S. Cl. 364—200 **7 Claims**



1. A distributed power system for a multiprocessor system of the kind in which separate processor modules are interconnected for parallel processing, said distributed power system comprising,

a plurality of separate processor modules,

interprocessor bus means interconnecting the processor modules for signaling and data transfer between the processor modules,

a plurality of device controllers for controlling the transfer of data between a plurality of processor modules and a plurality of peripheral devices,

multiple ports in each device controller and a separate input-/output bus associated with each port for connecting each device controller for access by different processor modules, and

distributed power supply means including a plurality of

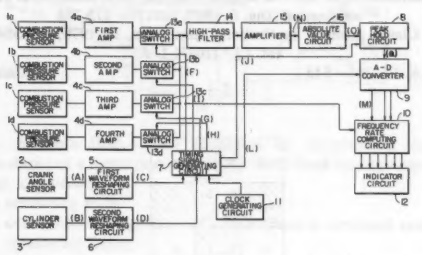
separate power supplies for providing continued operation of the multiprocessor system in the event of a failure of a single power supply to a part of the multiprocessor system,

said distributed supply means including a separate power supply for each processor module, a processor power supply bus connecting each processor module to its associated power supply, device controller power supply bus means connecting at least two of the separate power supplies to each device controller and switch means connecting each device controller to the device controller power supply bus means and effective in the event of the failure of one of the power supplies connected to any device controller to continue to supply power without interruption to the device controller from the other power supply connected to the device controller.

4,356,551
KNOCK DETECTING METHOD

Kazuo Iwase, Okazaki; Hisasi Kawai, Toyohashi; Kunimasa Yoshimura, Susono; Toshimitsu Ito, and Yoshiyasu Ito, both of Toyota, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Sep. 4, 1980, Ser. No. 184,188
Claims priority, application Japan, Sep. 5, 1979, 54-113916
Int. Cl.³ F02P *5/14, 17/00*
U.S. Cl. 364—431.08 **8 Claims**



1. A knock detecting method for an internal combustion engine having a plurality of cylinders and pistons therein, comprising the steps of:

detecting vibrations produced by a combustion event in each of the cylinders of said engine to generate an analog vibration output corresponding to said vibrations;

sample-and-holding a peak value of said analog vibration output generated during a predetermined period when each of said pistons is near top dead center of each said cylinder;

converting said peak value into a digital quantity;

storing said digital quantity a predetermined number of times for each of said cylinders, producing an average from a predetermined number of stored quantities for each of said cylinders, determining a proportion of those of said stored output data of each said cylinder which are greater than said average to obtain individual-cylinder frequency rates, and producing an average value of said individual-cylinder frequency rates for the number of said cylinders to obtain an all-cylinder frequency rate; and

determining that there exists a knock when the individual-cylinder frequency rate of at least one of said cylinders is greater than a first predetermined value or when said all-cylinder frequency rate is greater than a second predetermined value and thereby generating an output.

7. A device for detecting knocking in an internal combustion engine having a plurality of cylinders, said device comprising:

means for generating a knocking signal related to the level of vibrations during a predetermined period around the top dead center of each said cylinder;

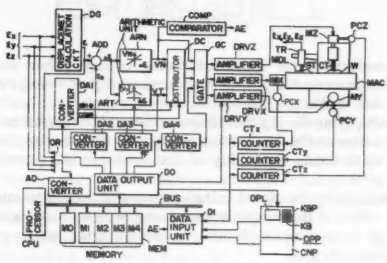
means for generating an individual-cylinder frequency signal for each of said cylinders, each said individual-cylinder frequency signal being related to the number of times said knocking signals for a corresponding one of said cylinders exceeds a first predetermined value, and generating an all-cylinder frequency signal related to the number of times all of said knocking signals exceed a second predetermined value; and

means for determining that knocking exists when at least one of said all cylinder frequency signal and said individual-cylinder frequency signals of at least one of said cylinders is greater than third and fourth predetermined values, respectively, and thereby generating an output.

4,356,552
TRACER CONTROL EQUIPMENT

Ryoji Imazeki, and Etsuo Yamazaki, both of Hachioji, Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan

Filed Mar. 19, 1980, Ser. No. 131,670
Int. Cl.³ G06F *15/46;* **G05B** *19/37*
U.S. Cl. 364—474 **16 Claims**



1. A tracer control system which is selectively operable in a plurality of trace modes for tracing a model, said system comprising:

means for calculating trace direction and trace velocity from displacement signals of a tracer head tracing the model surface during a selected tracing operation corresponding to a selected one of said trace modes;

trace mode selecting means for selecting one of said plurality of trace modes;

display means for displaying a respective set of parameters for defining said selected tracing operation for the selected trace mode; and

means for selectively setting the value of each said parameter during the display thereof.

4,356,553
METHOD FOR THE MEASURING OF ELECTRICAL POWER

Benedikt Steinle, Zug; Gernot Schneider, Baar, and Hans Nuenlist, Unterägeri, all of Switzerland, assignors to LGZ Landis & Gyr Zug AG, Zug, Switzerland

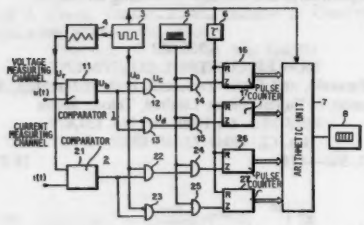
PCT No. PCT/CH79/00119, § 371 Date Jun. 25, 1980, § 102(e) Date Jun. 25, 1980, PCT Pub. No. WO80/01206, PCT Pub. Date Jun. 12, 1980
PCT Filed Sep. 5, 1979, Ser. No. 201,489
Claims priority, application Switzerland, Dec. 1, 1978, 12300/78
Int. Cl.³ G01R *21/06*
U.S. Cl. 364—483 **8 Claims**

1. In a method of measuring power delivered at an alternating voltage by an alternating current to a load, the steps comprising:

comparing the instantaneous alternating voltage and the

instantaneous alternating current with a periodically varying reference signal having a relatively high frequency compared to the frequency of the alternating voltage and the alternating current, thereby obtaining a plurality of first voltage-intersection and current-intersection points during the negative-going portions of the reference signal, and a plurality of second voltage intersection and current-intersection points during the positive-going portions of the reference signal,

said voltage intersection points representing instantaneous analog measurement values for the voltage, and said current intersection points representing instantaneous analog measurement values for the current,



transforming the measured analog voltage values and the measured analog current-values into digital voltage values and digital current-values, respectively,

multiplying the digital voltage values and the digital current-values at the first intersection points with one another, so as to obtain a plurality of first instantaneous power outputs,

multiplying the digital voltage values and the digital current-values at the second intersection points with one another, so as to obtain a plurality of second instantaneous power outputs, and

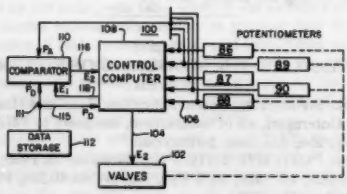
continuously integrating said power outputs so as to obtain an average power output.

4,356,554

METHOD AND APPARATUS FOR COMPENSATING FOR SYSTEM ERROR IN AN INDUSTRIAL ROBOT CONTROL

Kenneth J. Susnjara, Santa Claus, and Michael N. Diamond, Grand View, both of Ind., assignors to Thermwood Corporation, Dale, Ind.

Filed Sep. 12, 1980, Ser. No. 186,636
Int. Cl.³ G05B *19/23*
U.S. Cl. 364—513 **8 Claims**



5. A method of controlling a robot mechanism movable about a plurality of axes and through a plurality of motions for moving an implement from point to point over a predetermined path and having means for moving the robot mechanism and means for selectively controlling said means for causing the robot mechanism to operate over a predetermined path, comprising the steps of:

storing in prescribed locations of an operating data storage means operating data for a series of movements of the robot mechanism through a predetermined sequence of motions,

sensing the positions of the robot mechanism as each prescribed motion is completed and supplying corresponding sensor output signals,

comparing on a motion by motion basis the actual positions of the robot mechanism as determined from said sensor output signals with, respectively, corresponding desired positions of said robot mechanism as determined from said operating data and producing a first error signal having a value determined by the result of the comparison,

comparing on motion by motion basis the actual positions of the robot mechanism as determined from said sensor output signals with, respectively, corresponding desired positions of said robot mechanism as determined from said operating data and with said first error signal to produce a second error signal having a value corresponding with the result of the comparison and

moving the robot mechanism through a predetermined series of motions in increments corresponding with the values of said second error signal.

4,356,555

METHOD OF RESTORING A PICTURE CELL BY ESTIMATION WITH HIGH DENSITY

Koichi Ejiri, Chiba; Morisumi Kurose, Yokohama, and Seiji Hayakawa, Tokyo, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 20,054, Mar. 13, 1979, abandoned. This application Aug. 6, 1980, Ser. No. 175,703
Claims priority, application Japan, Mar. 24, 1978, 53-33843
Int. Cl.³ H04N *1/40*
U.S. Cl. 364—515 **3 Claims**

1. In a method of forming an image of a picture divided into plural equal square picture cells, wherein data compression is employed by sampling only selected of said cells in a checkered pattern in which each non-sampled cell is surrounded above, below and on both sides thereof by adjacent sampled picture cells, and said image is formed based on said sampled cells, the improvement comprising:

generating sampled data indicative of the light density of each of said sampled picture cells adjacent each non-sampled picture cell;

dividing each non-sampled cell into four separate sub-cells;

firstly determining how many of said sub-cells of each non-sampled cell are to be assigned a first predetermined light density and how many thereof are to be assigned a second predetermined light density based on the generated sampled light density data indicative of the light density of said adjacent sampled picture cells;

secondly determining which of said sub-cells are to be assigned said first predetermined light density and said second predetermined light density based on relative comparisons of the light density of predetermined sub-combinations of the sampled data of said adjacent sampled picture cells;

generating restored data based on said steps of firstly determining and secondly determining, said restored data defining which of said sub-cells of each non-sampled picture cell have assigned thereto said first predetermined light

density and which have assigned thereto said second predetermined light density; and

reproducing said image of said picture based on the sampled data indicative of the light density of said sampled picture cells and the restored data indicative of the light density of each sub-cell of each non-sampled picture cell.

4,356,556

METHOD OF DETERMINING THE BOUNDARIES OF A MEASURING PATH OF A GEAR FLANK TESTING APPARATUS AND GEAR FLANK TESTING APPARATUS FOR PERFORMANCE OF THE METHOD

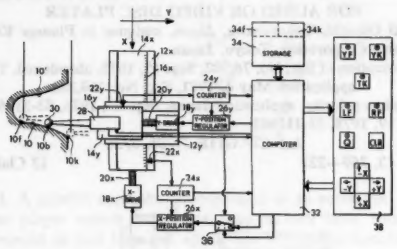
Armin Sterki, Uetikon, Switzerland, assignor to Maag Gear-Wheel & Machine Co. Ltd., Zürich, Switzerland

Filed Sep. 18, 1980, Ser. No. 188,843

Claims priority, application Switzerland, Oct. 11, 1979, 9184/79

Int. Cl.³ G01B *5/20, 7/28;* G06F *15/46*

U.S. Cl. 364—560 **2 Claims**



2. A tooth flank-testing apparatus for determining the boundaries of a measuring path of the tooth flank-testing apparatus, comprising:

a measuring feeler;

a cross-slide arrangement at which there is arranged said measuring feeler;

said cross-slide arrangement comprising a X-slide movable in the direction of the tooth width of a test piece and a Y-slide movable in the direction of the tooth height of the test piece;

an X-drive for moving said X-slide and which comprises:

an X-servomotor;

an X-position transmitter;

an X-position regulator;

a Y-drive for moving said Y-slide and which comprises:

a Y-servomotor;

a Y-position transmitter; and

a Y-position regulator;

both drives being selectively manually controllable or by means of a program-controlled computer;

said computer processing, apart from signals delivered by the position transmitters, also signals delivered by the measuring feeler itself in accordance with the deflection of its measuring head and interrupting the course of the computer program when the deflection exceeds a predetermined value;

storage means operatively connected with said computer for storage of position data of a tooth addenum point and a tooth base point as boundaries of a measuring path through which moves the feeler head along random number of tooth flanks; and

change-over switch means for selectively connecting the X-position regulator with the computer or the measuring feeler.

4,356,557

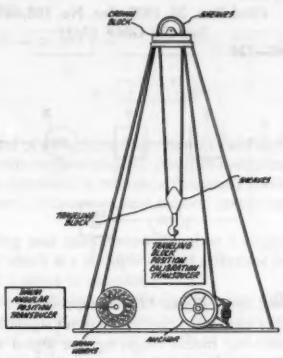
WINCH DRUM CABLE LENGTH MEASUREMENT APPARATUS

Leo A. Bell, Houston, Tex., and William H. Terbrack, Irvine, Calif., assignors to Cooper Industries, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 893,874, Apr. 6, 1978, abandoned. This application Sep. 27, 1979, Ser. No. 79,334

Int. Cl.³ G01B *7/04;* G06F *15/46*

U.S. Cl. 364—562 **3 Claims**



1. An improved wire length measurement apparatus for converting absolute angular position data of a drum motion transducer for a drum wrapped with multiple nested layers of coplanar, substantially round and multiturn wire into an output indication of the position of a traveling block attached to the wire, wherein the output indication is accurate independent of the number of layers of wire, the drum diameter and the diameter of the wire, said apparatus comprising:

(a) summing amplifier means for converting an input signal representing the absolute angular drum position to a wrap signal representing the length (L) of wire wound onto the drum;

(b) a first layer input means for applying an input signal to said summing amplifier representing the number of turns wound onto the first of said nested layers and for setting the gain of said summing amplifier such that said wrap signal represents the length of wire wrapped onto the drum;

(c) an isolation means, connected between the output of said drum motion transducer and the input of said first layer input means, for isolating said drum motion transducer and for producing a turns signal proportional to the output signal of said drum motion transducer and representing the absolute angular position of the drum relative to its position at a given initial setting;

(d) a second layer input means connected in parallel to the first layer input means for varying the gain of said summing amplifier such that when wire has been wrapped onto the second layer, the wrap signal of said summing amplifier represents the amount of wire wrapped onto both the first and second layers;

(e) an additional layer input means for each additional layer of wire to be wrapped for the same purposes as the second layer input means;

(f) a layer activation means connected to the inputs of said second and additional layer input means for activating said second and additional layer input means, thereby changing the gain of said summing amplifier, when the turns signal of said isolation means, representing the absolute angular drum position, indicates that wire is being wrapped onto the second and additional layers seriatem; and

(g) an output means connected between the output of said summing amplifier and the input of an output display for

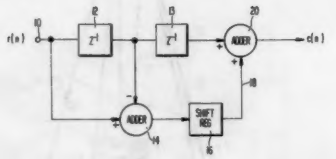
converting the wrap signal of said summing amplifier to an output signal in convenient engineering units for display.

4,356,558

OPTIMUM SECOND ORDER DIGITAL FILTER

William J. Owen, Littleton, and Robert A. Booker, Evergreen, both of Colo., assignors to Martin Marietta Corporation, Bethesda, Md.

Filed Dec. 20, 1979, Ser. No. 105,489
Int. Cl.³ G06F *15/31*
U.S. Cl. 364—724 **5 Claims**



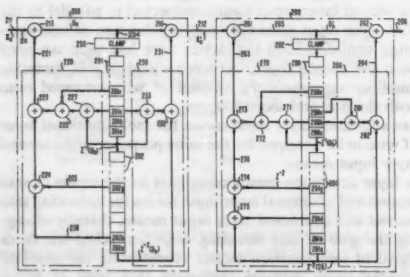
1. A second order digital filter comprising:
a first delay element receiving an input signal r(n);
a first summing means receiving the signal r(n) and the output of said first delay element, and producing a summed output;
shift register means receiving the output of said first summing means and shifting the summed output a predetermined number of places;
a second delay element coupled to said first delay element, and;
a second summing means receiving the outputs from said shift register and said second delay element and producing a compensated output c(n), where $\nabla^2 c(n)=r(n)+k_1(r(n)-r(n-1))+k_2((r(n)-r(n-1))-(r(n-1)-r(n-2))$, wherein: k_1 and k_2 are binary scalars, r(n) is the latest input sample, r(n−1) is the prior sample, r(n−2) is the second prior sample.

4,356,559

LOGIC ARRANGEMENT FOR RECURSIVE DIGITAL FILTER

James C. Candy, Middletown, and Bruce A. Wooley, Tinton Falls, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 1, 1980, Ser. No. 174,516
Int. Cl.³ G06F *15/34*
U.S. Cl. 364—724 **14 Claims**



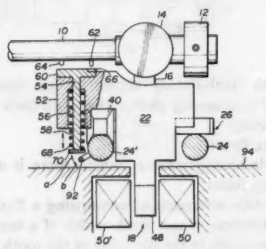
1. Apparatus for filtering an input signal comprising a series of multibit input words, each of said words including an essential portion, a sign bit, and at least L repetitions of said sign bit, said apparatus including:
first and second serially connected delay elements (**201, 202**) each arranged to store the number of bits contained in one of said input words;
logic means (**220, 230**) for combining selected ones of the last L bits stored in each of said delay elements in accordance with first and second predetermined relationships to generate feedback and feedforward signals, respectively,
first means (**213**) for combining, bit by bit, said feedback signal with said input signal to yield an intermediate signal, and
second means (**210**) for combining, bit by bit, said intermediate signal with said feedforward signal to yield the output signal of said filter,
characterized in that said apparatus includes means (**250**) responsive to said intermediate signal for forming the input to said first delay element, said means arranged to repeat the last L predetermined bits in each word of said intermediate signal to have the same value as the sign bit of said each word.

4,356,560

LINEAR-TRACKING PICK-UP ARM DRIVE ASSEMBLY FOR AUDIO OR VIDEO DISC PLAYER

Juniti Ohnishi, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 76,702, Sep. 19, 1979, abandoned. This application May 4, 1981, Ser. No. 260,283
Claims priority, application Japan, Sep. 19, 1978, 53-115681; Sep. 19, 1978, 53-115682
Int. Cl.³ G11B *21/08, 3/36*
U.S. Cl. 369—221 **13 Claims**



1. A linear-tracking pick-up arm drive assembly for a disc player, comprising horizontally elongated, stationary first and second guide bars spaced apart substantially in parallel from each other; a movable unit supported in weight transmitting relationship on said guide bars and movable along the guide bars, said movable unit carrying thereon a linear-tracking pick-up arm having a leading end and rotatable with respect to said movable unit about a substantially horizontal axis substantially perpendicular to the direction of elongation of said pick-up arm; electromagnetic drive means for driving said movable unit along said guide bars; and pick-up arm lifting means engageable with said pick-up arm for turning said pick-up arm upwardly about said horizontal axis with respect to said movable unit, said lifting means including a lifting member supported by said movable unit and vertically movable with respect to said movable unit and said pick-up arm, and drive means for vertically driving said lifting member, said pick-up arm having a first projection and a second projection, said projection and said second projection being spaced from one another in the direction of elongation of said pick-up arm and projecting downward toward said lifting member, said first projection being remoter from said leading end of the pick-up arm than said second projection, said lifting member being formed with an open-ended groove positioned below said first projection and adapted to capture said first projection when

said lifting member is brought into engagement with said pick-up arm.

4,356,561

CONTROL APPARATUS IN AUTOMATIC AUDIO DISC PLAYER

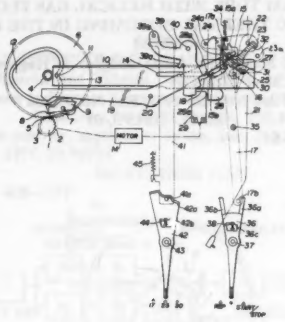
Yuji Ikedo, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 24, 1980, Ser. No. 133,138

Claims priority, application Japan, Mar. 27, 1979, 54-36063; Mar. 27, 1979, 54-36064; Mar. 27, 1979, 54-36065; Mar. 27, 1979, 54-39417[U]

Int. Cl.³ G11B *17/30, 21/02*

U.S. Cl. 369—225 **13 Claims**



1. A control apparatus incorporated in an automatic audio disc player which includes a base, a turn table rotatably mounted on said base and a tone arm swingably mounted on said base for picking up audio signals recorded on a recording medium disposed on said turn table, the apparatus comprising a drive member so mounted on said base as to linearly move between a home position and an utmost position with respect to said base; control means connected to said drive member, for urging said drive member to move from said home position up to said utmost position and to return to said home position when it is triggered; trigger means connected to said control means, for triggering said control means when operated; a lead member fixedly connected to said tone arm and being swingable together with said tone arm; latch means mounted on said drive member, for latching said lead member on to said drive member when said drive member takes said utmost position; limit means mounted on said base and being engageable with said lead member, for limiting the extent of rotation of said lead member when said slide member exists at and near said utmost position; and cam means associated with said drive member, for raising said tone arm when said drive member exists at and near said utmost position, said control means including a switch lever loosely engaged at the central portion thereof with said drive member, a mechanically-operated switch fixedly mounted on said base and having the armature button thereof engaged with one end of said switch lever, said switch being non-conductive when said the armature button is urged, hold means connected with said tone arm, for holding the other end of said switch lever, support means connected to said trigger means, for supporting said central portion of said switch lever until it is triggered, so that said switch lever urges said the armature button of said switch, a prime mover connected to said switch to start rotation when said switch becomes conductive, and a cam arrangement connected to said drive member, for pushing said drive member from said home position to said utmost position and subsequently for retracting said drive member from said utmost position to said home position, when it is triggered.

4,356,562

METHOD AND APPARATUS FOR DEMULTIPLEXING ELECTRICAL SIGNALS

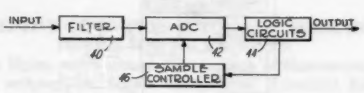
Keith G. Wright, Nepean, Canada, assignor to Control Data Canada, Ltd., Mississauga, Canada

Filed Mar. 4, 1980, Ser. No. 127,140

Claims priority, application Canada, Feb. 21, 1980, 346120

Int. Cl.³ H03D *3/18;* **H04J** *3/06;* **H04L** *7/04*

U.S. Cl. 370—20 **32 Claims**



1. A method of demultiplexing a multiplexed signal comprising components representing the result of multiplexing at least one original signal and a reference frequency having in phase and quadrature components, said method comprising the steps of:

(a) sampling said multiplexed signal at a controllable frequency which is a multiple of said reference frequency to provide a series of samples;

(b) rearranging the samples of said series into different series representative of said at least one original signal and the in phase and quadrature components of said frequency;

(c) determining the phase differential between said reference and controllable frequencies by determining the d.c. content of the series which represent the in phase and quadrature components of the reference frequency; and

(d) adjusting said controllable frequency toward synchronism with said reference frequency by an amount which is a function of the phase differential determined in step (c).

31. A bit detector for detecting and identifying the bit stream of a signal comprising a pulse code modulated sequence of data transmitted at a transmission rate Fc, said detector comprising:

an analog-to-digital converter for detecting the voltage level of said signal at predetermined instants of time, converting the detected voltage levels into a series of electrical signals representing binary numbers "1" or "0" wherein a "1" represents a positive voltage level and a "0" represents a negative voltage level, and outputting said series of electrical signals;

a controller for generating and providing detecting signals to said converter, said controller being adapted to generate said detecting signals at a controllable rate which is substantially equal to two times said transmission rate and having a phase control for selectively advancing or delaying said controllable rate and a magnitude control for selectively increasing or reducing the magnitude of said controllable rate; and

electrical circuit means for analyzing said series of electrical signals in groups of five signals at intervals of two signals, with the first signal in each group representing original data, by comparing the second and fourth signals with their adjacent signals, and providing a control signal to said controller;

said controller being responsive to said control signal for adjusting at least one of said phase and magnitude controls.

4,356,563

AUTOMATIC DIGITAL TELEPHONE EXCHANGE

Ernesto Viale, Turin, Italy, assignor to CSELT - Centro Studi e Laboratori Telecomunicazioni S.P.A., Turin, Italy

Continuation-in-part of Ser. No. 128,519, Mar. 10, 1980, abandoned. This application Jun. 18, 1981, Ser. No. 275,020

Claims priority, application Italy, Mar. 15, 1979, 67544 A/79

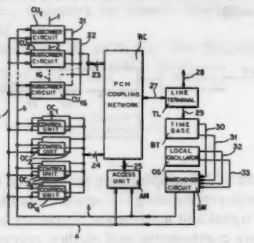
Int. Cl.³ H04Q *3/54, 11/04*

U.S. Cl. 370—58 **5 Claims**

1. In an automatic digital telephone exchange serving a

group of associated subscriber stations divided into several subgroups, in combination:

a set of substantially identical control units assigned to each subgroup of subscriber stations and programmed to carry out different but mutually complementary operations in the establishment and termination of a telephone connection involving at least one station of the respective subgroup;



a common PCM coupling network for each set accessible to each of said control units thereof, to the subscriber stations of the respective subgroup, and to terminal means common to said group; and

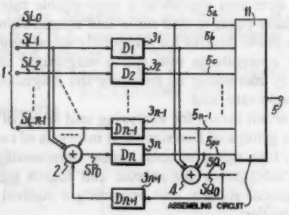
an access unit for each set responsive to signals from said control units thereof for satisfying requests for connection to said coupling network, said control units communicating with one another via said coupling network under the command of said access unit.

4,356,564

DIGITAL SIGNAL TRANSMISSION SYSTEM WITH ENCODING AND DECODING SECTIONS FOR CORRECTING ERRORS BY PARITY SIGNALS TRANSMITTED WITH DIGITAL INFORMATION SIGNALS

Toshitada Doi, Kanagawa; Shunsuke Furukawa, Tokyo, and Kenji Nanba, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 22, 1980, Ser. No. 123,721
Claims priority, application Japan, Feb. 27, 1979, 54-22460
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—40 **10 Claims**



1. In a digital transmission system in which a digital signal is transmitted in the form of digital words and in which at least first and second error correcting signals are included in the digital signal so transmitted, an encoding section comprising:

means for applying a sequence of selected ones of said words of the digital signal to a first channel and the remaining words to at least one further channel;

first adder means for adding a plurality of said words of the digital signal together with said second error correcting signal to produce said first error correcting signal;

delay means for delaying said remaining words of the digital signal by one amount of delay and for delaying said first error correcting signal by another amount of delay;

second adder means for adding at least one of the delayed words and the delayed first error correcting signal to produce said second error correcting signal;

feedback means for feeding said second error correcting signal back to said first adder means so that the latter adds said second error correcting signal together with said plurality of words of the digital signal to produce said first error correcting signal; and

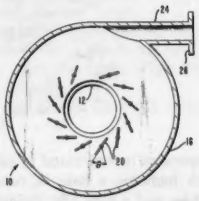
output means for providing said words of the digital signal, said delayed first error correcting signal and said second error correcting signal as the output of said encoding section to be transmitted.

4,356,565

LASER BEAM TUBE WITH HELICAL GAS FLOW FOR REDUCING THERMAL BLOOMING IN THE LASER BEAM

Peter I. Shen, San Pedro, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 26, 1979, Ser. No. 97,286
Int. Cl.³ H01S *3/03*
U.S. Cl. 372—61 **6 Claims**



1. An arrangement for reducing thermal blooming in a laser beam comprising:

a tubular member;

means for causing a laser beam which is subject to thermal blooming to propagate longitudinally through said tubular member; and

means operatively associated with said tubular member for producing vortical flow of a gas having low absorption properties at the wavelength of said laser beam and for introducing the vortically flowing gas into said tubular member such that said gas is caused to flow along a helical path within said tubular member with a ratio of the tangential velocity to the axial velocity of the vortically flowing gas such that a temperature gradient of an offsetting nature to the temperature gradient due to said thermal blooming of said beam is produced.

4,356,566

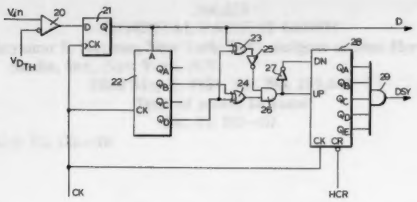
SYNCHRONIZING SIGNAL DETECTING APPARATUS

Ryoichi Wada, Habikino; Takanori Seno, and Mitsuharu Tsuchiya, both of Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 4, 1980, Ser. No. 118,220
Claims priority, application Japan, Feb. 8, 1979, 54-13593
Int. Cl.³ H04L *7/00*
U.S. Cl. 375—116 **5 Claims**

1. A synchronizing signal detecting circuit comprising a shift register which introduces input pulses in succession in synchronism with clock pulses, a gate circuit which detects whether the contents of said shift register corresponds to a fixed predetermined pulse pattern and which procudes a coincidence signal when the contents of said shift register corresponds to said fixed predetermined pulse pattern, and a detec-

tor circuit which is connected to said gate circuit and which detects a duration period of said coincidence signal, said dura-



tion period corresponding to the period of a fixed predetermined number of said fixed predetermined pulse patterns.

4,356,567

RADIO RECEIVER WITH BANDWIDTH SWITCHING

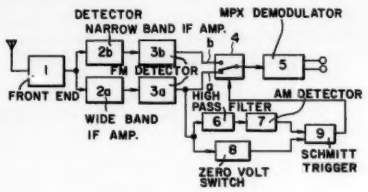
Yoichi Eguchi, and Takeshi Yokota, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jun. 28, 1978, Ser. No. 919,648

Claims priority, application Japan, Jun. 28, 1977, 52-76771; Jun. 28, 1977, 52-76772

Int. Cl.³ H04B *1/16*

U.S. Cl. 455—177 **6 Claims**



1. A radio receiver, comprising:

a first intermediate frequency amplifier having a broad band characteristic;

a first detector having a tuning frequency for detecting the output of said first intermediate frequency amplifier;

a second intermediate frequency amplifier having a narrow band characteristic;

a second detector having a tuning frequency for detecting the output of said second intermediate frequency amplifier;

an interference signal detecting means for providing an output when the magnitude of a noise component such as an interference distortion signal or a pulsating noise signal contained in a demodulation signal of said first detector exceeds a predetermined magnitude;

a zero volt switch which detects the level of a near-by interference signal present in the vicinity of the tuning frequency of said first or second detector and provide an output when the level of the near-by interference signal is at a predetermined level;

a control signal generating means for generating a control signal in response to either of the outputs of said interference signal detecting means and zero volt switch; and

switching means controlled by the presence or absence of said control signal to switch between a first position in which it passes the demodulation signal of said first detector and a second position in which it passes the demodulation signal of said second detector.

4,356,568

RECEPTIVE CONDITION AUTOMATIC SELECTION DEVICE FOR FM RECEIVER

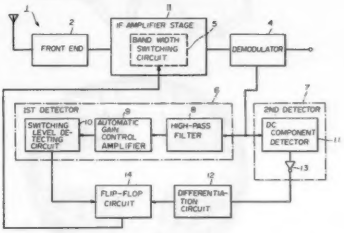
Minoru Ogita, and Naobumi Kimura, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Jun. 23, 1978, Ser. No. 918,513

Claims priority, application Japan, Jul. 2, 1977, 52-87765[U]

Int. Cl.³ H04B *1/10, 1/16*

U.S. Cl. 455—212 **5 Claims**

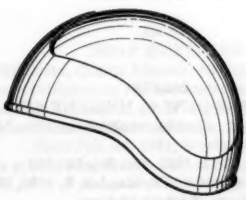


1. A reception condition selection device for an FM receiver, comprising: means for changing a signal receiving frequency band width of said receiver; a first detector for detecting a noise component in a demodulation signal from a demodulator in said receiver and producing a first signal when said noise component is higher than a first detection level; a second detector for detecting a tuning condition of said receiver and producing an output signal when the receiver is tuned; means for generating a second signal in accordance with said second detector output signal; bistable circuit means responsive to said first signal for switching said band width changing means to a signal reception of a first band width and responsive to said second signal for switching the band width changing means to a signal reception of a second band width which is broader than said first band width; and

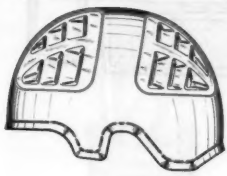
a third detector for detecting the noise component in said demodulation signal and producing a third signal when said noise component is lower than a second detection level which is higher than said first detection level, said second signal generating means including a logical circuit producing said second signal in response to the existence of both said third signal and said second detector output signal.

266,625
HOSPITAL PATIENT GOWN
Seymour S. Herman, New York, N.Y., assignor to Stan Herman Studio, Inc., New York, N.Y.
Filed May 1, 1981, Ser. No. 259,443
Term of patent 14 years
Int. Cl. D2—*01*
U.S. Cl. D2—16

266,626
POLICE HELMET
Elwyn R. Gooding, Ann Arbor, Mich., assignor to The Regents of the University of Michigan, Ann Arbor, Mich.
Filed Sep. 11, 1980, Ser. No. 186,283
Term of patent 14 years
Int. Cl. D02—*03*
U.S. Cl. D2—231

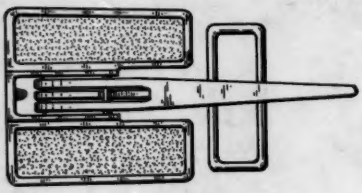


266,627
PROTECTIVE HELMET FOR ATHLETES
Elwyn R. Gooding, Ann Arbor, Mich., assignor to The Regents of the University of Michigan, Ann Arbor, Mich.
Filed Sep. 11, 1980, Ser. No. 186,718
Term of patent 14 years
Int. Cl. D02—*03*
U.S. Cl. D2—231



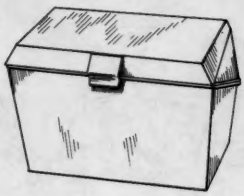
266,628
HAT OR SIMILAR ARTICLE
Dixie A. Bour, 69 Saxony Cir., Little Rock, Ark. 72209
Filed Apr. 14, 1980, Ser. No. 139,866
Term of patent 14 years
Int. Cl. D02—*03*
U.S. Cl. D2—251

266,629
BUCKLE OR SIMILAR ARTICLE
Jack O. Stacy, Tulsa, Okla., assignor to Michial L. Bell, Tulsa, Okla.
Filed Aug. 25, 1980, Ser. No. 181,200
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—444



266,630
BOW TEMPLATE
John D. O'Brien, Palmer, Mass., assignor to Wm. E. Wright Co., West Warren, Mass.
Filed Oct. 17, 1980, Ser. No. 197,783
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D3—26

266,631
DOCUMENT FILE
E. Bryant Crutchfield, Dayton, Ohio, assignor to The Mead Corporation, Dayton, Ohio
Filed Oct. 31, 1980, Ser. No. 202,849
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—30.1



266,632
CASE FOR SPINNING ROD AND ACCESSORIES
Kent A. Schroeder, 419 W. 31st St., Kearney, Nebr. 68847
Filed Nov. 12, 1980, Ser. No. 205,930
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—38

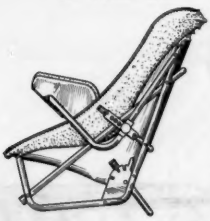
266,633
PORTABLE DENTAL HYGIENE KIT
John Wink, Kitchener, Canada, assignor to Anja Marketing Inc., Waterloo, Canada
Filed Apr. 21, 1980, Ser. No. 141,967
Claims priority, application Canada, Jan. 8, 1980, 08-01-80-1
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—18

266,634

JUVENILE SEAT

Roy E. Knoedler, and Otis J. Basey, both of Columbus, Ind., assignors to Cosco, Inc., Columbus, Ind.

Filed Oct. 28, 1980, Ser. No. 201,551
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—9

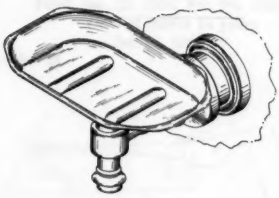


266,635

SOAP DISH

Gary A. Fleischmann, Sheboygan, Wis., and Lawrence C. Peabody, Rindge, N.H., assignors to Kohler Co., Kohler, Wis.

Division of Ser. No. 138,836, Apr. 10, 1980, Pat. No. Des. 262,922. This application Mar. 19, 1981, Ser. No. 245,330
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—90

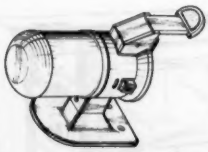


266,636

SOAP DISPENSER

Haruo Nishimura, Osaka; Masaaki Nakaya, Toyonaka; Katsuji Nakano, Nishinomiya; Noboru Matsuda, Joyo, and Noriyuki Matsumoto, Toyonaka, all of Japan, assignors to Duskin Franchise Kabushiki Kaisha, Osaka, Japan

Filed Feb. 24, 1981, Ser. No. 237,779
Claims priority, application Japan, Nov. 6, 1980, 55-46473
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—95



266,637

COMBINED ADVERTISING DISPLAY STAND AND BROCHURE HOLDER

Michael J. Edwards, 21 Earle St., Cremorne, New South Wales 2090, Australia

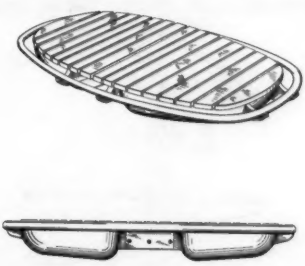
Filed Apr. 2, 1980, Ser. No. 136,646
Claims priority, application Australia, Nov. 12, 1979, 79543
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—146

266,638

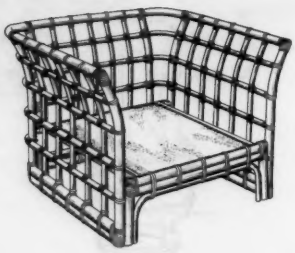
SPA TABLE

Donald W. Doman, Janesville, and Alfred W. Elsner, Plymouth, both of Wis., assignors to Kohler Co., Kohler, Wis.

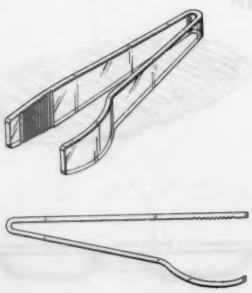
Filed Jul. 25, 1980, Ser. No. 172,458
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—177



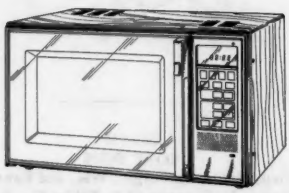
266,639
CHAIR FRAME CONSTRUCTION
Robert K. Thorpe, Newport Beach, Calif., assignor to Scott Paper Company, Philadelphia, Pa.
Filed Apr. 9, 1980, Ser. No. 138,800
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191



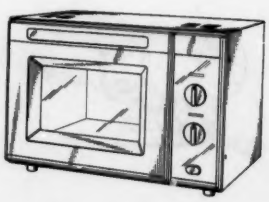
266,640
TONGS
Edgar F. Trombly, Grosse Pointe Farms, Mich., assignor to Thermo-Serv, Inc., Anoka, Minn.
Filed Oct. 8, 1980, Ser. No. 195,043
Term of patent 14 years
Int. Cl. D07—*06*
U.S. Cl. D7—105



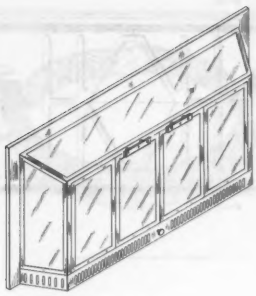
266,641
MICRO-WAVE OVEN
Masamichi Yamamura, Osaka; Toshio Harada, and Michio Tanaka, both of Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Dec. 18, 1980, Ser. No. 217,933
Claims priority, application Japan, Jul. 3, 1980, 55-26648
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—128



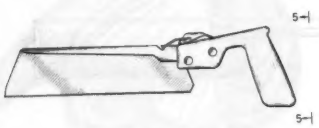
266,642
MICROWAVE OVEN
Toshio Harada, Nara, Japan; Rolf Feil, Wasserburg, and Roland Vetter, Giengen, both of Fed. Rep. of Germany, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jun. 2, 1981, Ser. No. 269,089
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1980, MR 5256
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—128



266,643
FIRE SCREEN
Ralph E. Matthews, Decatur, Ala., assignor to Matthews Machine Co., Inc., Decatur, Ala.
Filed Apr. 23, 1979, Ser. No. 32,719
Term of patent 14 years
Int. Cl. D7—*08*
U.S. Cl. D7—208

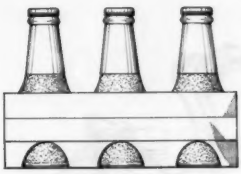


266,644
HAND SAW
Hiroji Shimizu, Miki, Japan, assignor to Shin Nihon Kinzoku Kabushiki Kaisha, Miki, Japan
Filed Aug. 22, 1980, Ser. No. 180,497
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—95



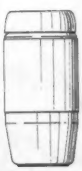
266,645
PULL
Teresa R. B. Pittenger, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.
Filed Jun. 23, 1980, Ser. No. 162,130
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—307

266,646
PACKAGE OF BEVERAGE BOTTLES
Jean-Claude Beton, Marseilles, France, assignor to Compagnie Francaise des Produits Orangina, Marseilles, France
Filed Nov. 19, 1980, Ser. No. 208,172
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—337

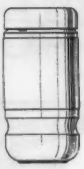


266,647
JAR
William J. Plewes, Gormley; Alessandro Baggio, and Wolfgang Letzin, both of Toronto, all of Canada, assignors to General Foods Inc., Canada
Filed Nov. 4, 1980, Ser. No. 203,829
Claims priority, application Canada, May 6, 1980, 06-05-80-1
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—349

266,648
COMBINED JAR AND LID
William J. Plewes, Gormley; Alessandro Baggio, and Wolfgang Letzin, both of Toronto, all of Canada, assignors to General Foods Inc., Canada
Filed Nov. 4, 1980, Ser. No. 203,828
Claims priority, application Canada, May 6, 1980, 06-05-80-4
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—353

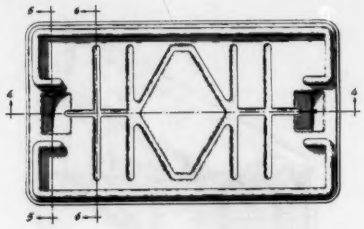


266,649
COMBINED JAR AND LID
William J. Plewes, Gormley; Alessandro Baggio, and Wolfgang Letzin, both of Toronto, all of Canada, assignors to General Foods Inc., Canada
Filed Nov. 4, 1980, Ser. No. 203,917
Claims priority, application Canada, May 6, 1980, 0605-80-3
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—353



266,650
BOTTLE
Timo Sarpaneva, Helsinki, Finland, assignor to A. Ahlstrom Osakeyhtio, Noormarkku, Finland
Filed Nov. 8, 1979, Ser. No. 92,489
Claims priority, application Finland, May 18, 1979, 79326
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—354

266,651
BOX COVER
Jean-Marie Chabot, St-Damien, Canada, assignor to Les Industries Provinciales Ltee, St-Damien, Canada
Filed Nov. 4, 1980, Ser. No. 203,997
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—435



266,652
ILLUMINATED WHISTLE
Dietmar Nagel, 147 South Rd., Chester, N.J. 07930
Filed Apr. 21, 1980, Ser. No. 142,419
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—119

266,653
EXTENSION FOR CONE-SHAPED TRAFFIC MARKER
Yang-Hwi Cho, Painesville, Ohio, assignor to Park & Willow Crafts Corp., Painesville, Ohio
Filed Jan. 25, 1980, Ser. No. 115,188
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—121

266,654
NECKLET
Marina Bulgari, Athens, Greece, assignor to Zoldia Anstalt, Vaduz, Liechtenstein
Filed Nov. 18, 1980, Ser. No. 207,988
Claims priority, application Italy, May 27, 1980, 35780/80[U]
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—5

266,655
FIGURINE OF AN ANTEATER
Jesus A. Carbajales Santa Eulalia, and Javier B. Carbajales Santa Eulalia, both of Montevideo, Uruguay, assignors to John J. Madison Co., Inc., Laguna Hills, Calif.
Filed May 15, 1978, Ser. No. 906,355
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—158

266,656
FIGURINE OF AN OTTER
Jesus A. Carbajales Santa-Eulalia, and Javier B. Carbajales Santa-Eulalia, both of Montevideo, Uruguay, assignors to John J. Madison Co., Inc., Laguna Hills, Calif.
Filed May 15, 1978, Ser. No. 906,356
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—158

266,657
FIGURINE OF A CAMEL
Jesus A. Carbajales Santa-Eulalia, and Javier B. Carbajales Santa-Eulalia, both of Montevideo, Uruguay, assignors to John J. Madison Co., Inc., Laguna Hills, Calif.
Filed May 15, 1978, Ser. No. 906,358
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—158

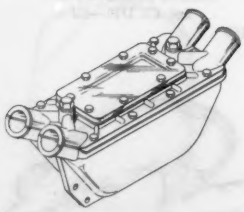
266,658
FIGURINE OF A FOX
Jesus A. Carbajales Santa-Eulalia, and Javier B. Carbajales Santa-Eulalia, both of Montevideo, Uruguay, assignors to John J. Madison Company, Inc., Laguna Hills, Calif.
Filed Dec. 15, 1978, Ser. No. 970,006
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—158

266,659
STATUETTE
Alexander Kasack, 36 Beech St., Rutherford, N.J. 07070
Continuation-in-part of Ser. No. 811,088, Jun. 29, 1977, abandoned. This application Dec. 20, 1979, Ser. No. 105,443
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—160

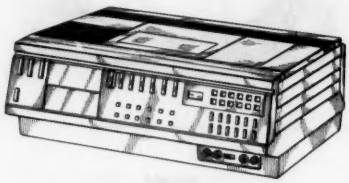
266,660
FIGURINE OF A PELICAN
Jesus A. Carbajales Santa-Eulalia, and Javier B. Carbajales Santa-Eulalia, both of Montevideo, U'ruguay, assignors to John J. Madison Co., Inc., Laguna Hills, Calif.
Filed May 15, 1978, Ser. No. 906,352
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—162

266,661
FIGURINE OF A CONDOR
Jesus A. Carbajales Santa-Eulalia, and Javier B. Carbajales Santa-Eulalia, both of Montevideo, Uruguay, assignors to John J. Madison Co. Inc., Laguna Hills, Calif.
Filed May 15, 1978, Ser. No. 906,354
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—162

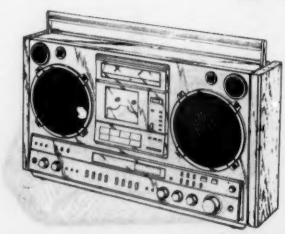
266,662
ELECTRICAL CABLE SPLICE ENCLOSURE
Kenneth W. Brownell, and Robert C. Hazenfield, both of Asheville, N.C., assignors to Akzona Incorporated, Asheville, N.C.
Filed Apr. 14, 1980, Ser. No. 140,025
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—13



266,663
VIDEO TAPE RECORDER
Takashi Matsumoto, Yokohama, and Jun Ishii, Tokyo, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan
Filed Jun. 20, 1980, Ser. No. 161,460
Claims priority, application Japan, Dec. 26, 1979, 54-54356
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—2



266,664
COMBINED RADIO RECEIVER AND TAPE RECORDER
Kunio Hoshino; Kazumasa Takenaka, both of Katano; Teruyuki Nishimoto; Shuhei Taguchi, both of Hirakata; Kikuo Ohta, Ikoma, and Benito Mishiro, Sasai, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Sep. 30, 1980, Ser. No. 192,562
Claims priority, application Japan, Apr. 2, 1980, 55-13164
Term of patent 14 years
Int. Cl. D14—*01, 03*
U.S. Cl. D14—5

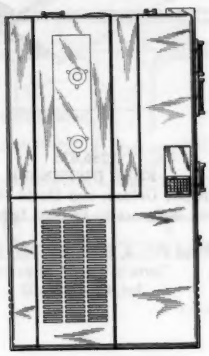


266,665

CASSETTE TAPE RECORDER OR THE LIKE

Arthur J. Pulos, Fayetteville, and Michael Cridland, Manlius, both of N.Y., assignors to Dictaphone Corporation, Rye, N.Y.

Filed Feb. 3, 1981, Ser. No. 231,422
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—6

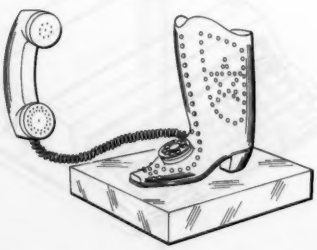


266,666

TELEPHONE

Wesley L. Thomas, 109 S. Catalina St., Los Angeles, Calif. 90004

Filed Jan. 15, 1980, Ser. No. 112,307
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53

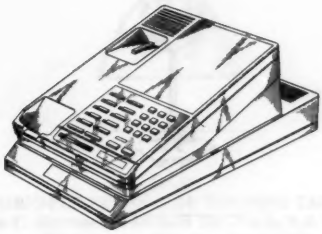


266,667

COMBINED TELEPHONE AND DATA SET BASE

James W. M. Bee, Palo Alto, Calif., assignor to Northern Telecom Limited, Montreal, Canada

Filed Oct. 31, 1979, Ser. No. 89,938
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—58

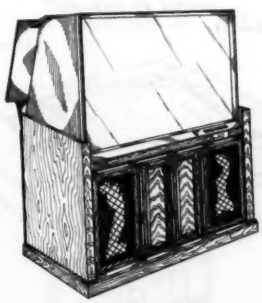


266,668

PROJECTION TELEVISION RECEIVER

Melvin H. Boldt, Glenview; David P. Chuboff, North Barrington; Clement W. Trottier, Prospect Heights, and Robert E. Slater, Vernon Hills, all of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Feb. 2, 1981, Ser. No. 230,980
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—79



266,669

COMBINED BILLING AND CONTROLLER TERMINAL FOR FILLING STATIONS

Masaji Sawada, and Tsutomu Yamasaki, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan

Filed Jun. 6, 1980, Ser. No. 157,240

Claims priority, application Japan, Dec. 14, 1979, 54/53187

Term of patent 14 years

Int. Cl. D6—*04;* D14—*02*

U.S. Cl. D14—102

266,670

MAGNETIC DISC DRIVE

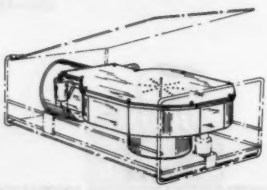
Terence H. West, San Jose, Calif., assignor to Priam Corporation, San Jose, Calif.

Filed May 15, 1980, Ser. No. 149,973

Term of patent 14 years

Int. Cl. D14—*02*

U.S. Cl. D14—109



266,671

ELECTROSTATIC PRINTER/PLOTTER

Ian Turner, Sunnyvale; Thomas A. Tacklind, San Jose; Carl J. Clement, Los Altos Hills, and Fred H. Stengel, Palo Alto, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 11, 1980, Ser. No. 139,539

Term of patent 14 years

Int. Cl. D14—*02*

U.S. Cl. D14—111

266,672

CONSOLE FOR KEYBOARD AND DISPLAY SCREEN

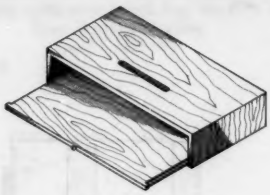
Luther L. Landin, 2377 Kings Point Dr., Dunwoody, Ga. 30338

Filed Aug. 11, 1980, Ser. No. 177,056

Term of patent 14 years

Int. Cl. D14—*02;* D6—*04*

U.S. Cl. D14—114



266,673

FUEL DISPENSER

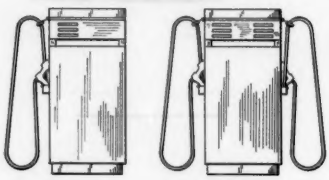
Glenn W. Monigle, Golden, and David W. Roecker, Denver, both of Colo., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Feb. 4, 1980, Ser. No. 118,376

Term of patent 14 years

Int. Cl. D15—*02*

U.S. Cl. D15—9.1



266,674

TYPEWRITER

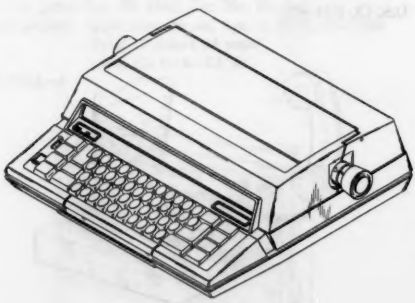
John E. Jolliffe, Manlius, N.Y., assignor to SCM Corporation, New York, N.Y.

Filed Oct. 31, 1980, Ser. No. 202,834

Term of patent 14 years

Int. Cl. D18—*01*

U.S. Cl. D18—1

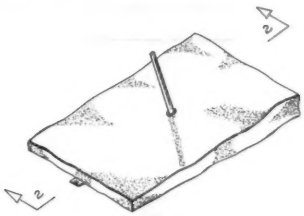


266,675
DESK ACCESSORY SYSTEM
Marlan H. Polhemus, Chicago, and Lonnie E. Frye, Arlington Heights, both of Ill., assignors to Tenex Corporation, Elk Grove Village, Ill.
Filed Feb. 22, 1980, Ser. No. 123,672
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—22

266,676
WRITING INSTRUMENT
Pierre Bove, Villars-sur-Glane, Switzerland, assignor to Interdica S.A., Villars-sur-Glane, Switzerland
Filed Nov. 28, 1979, Ser. No. 98,253
Claims priority, application Hague, May 31, 1979, 68.868/79
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—50

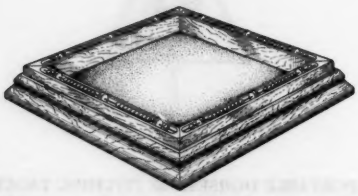
266,677
PAPERWEIGHT
Russ Pinson, 8415 #D McKinley Ave., Tacoma, Wash. 98445
Filed Aug. 8, 1980, Ser. No. 176,557
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—97

266,678
PORTABLE HORSESHOE PITCHING TARGET
William C. Herrmann, 3 Orchard Ter., Clark, N.J. 07066
Filed Jan. 31, 1980, Ser. No. 117,052
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—4

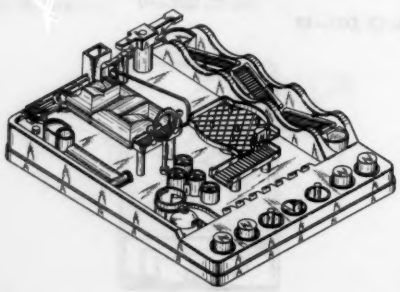


266,679
ELECTRONIC HAND-HELD ROAD RACE GAME HOUSING OR THE LIKE
Tsuneo Hanzawa, Tokyo, Japan, assignor to Entex Industries, Inc., Compton, Calif.
Filed Feb. 4, 1980, Ser. No. 117,968
Claims priority, application Japan, Dec. 24, 1979, 54-54609
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—13

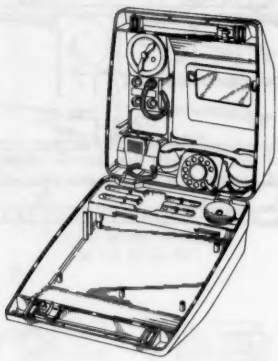
266,680
DICE GAME BOARD
David E. Compton, 3310 Gertrude Dr., Magna, Utah 84044
Filed Oct. 14, 1980, Ser. No. 196,538
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—41



266,681
OBSTACLE GAME BOARD
Masaaki Yoshimura, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Jan. 28, 1980, Ser. No. 115,632
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—59

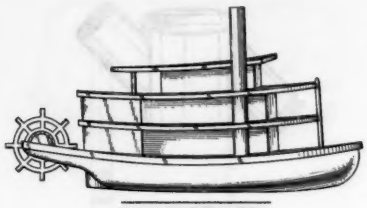


266,682
TOY ACTIVITY CASE
Geoffrey N. Airlie, Nottingham, England, assignor to Dobson Park Industries Limited, Nottingham, England
Filed May 28, 1980, Ser. No. 154,104
Claims priority, application United Kingdom, Dec. 3, 1979, 79992644
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—59



266,683
BOOMERANG
Alexander N. Zobkiw, 830 Edgefield Dr., Bowling Green, Ky. 42101
Filed Sep. 17, 1979, Ser. No. 74,651
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—82

266,684
TOY PADDLE WHEEL BOAT
Charles E. Hughes, 172 W. Eugenie St., Chicago, Ill. 60614
Filed Dec. 14, 1979, Ser. No. 103,691
The portion of the term of this patent subsequent to Dec. 11, 1993, has been disclaimed.
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—130



266,685
TOY FIGURE
Stuart Freeborn, Esher, England; George W. Lucas, Jr., San Anselmo, and Ralph McQuarrie, Berkeley, both of Calif., assignors to Lucasfilm, Ltd., San Rafael, Calif.
Filed Apr. 18, 1980, Ser. No. 141,595
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—177

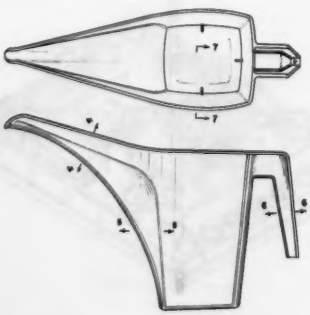
266,686
CLUB FOR A BALL AND CLUB GAME
Carl F. Dretzke, 777 Depot St., Rte. 2, Box 35, Manawa, Wis. 54949
Filed Nov. 6, 1980, Ser. No. 204,611
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—211

266,687
GOLF CLUB IRON HEAD
Samuel P. Simmons, Torrance, Calif., assignor to Sigma Diversified Sports, Inc., Torrance, Calif.
Filed Nov. 20, 1980, Ser. No. 208,562
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—220

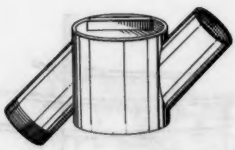
266,688
SKI
Anton Arnsteiner, Klausen 3, 5730 Mittersill, Austria
Filed Mar. 4, 1980, Ser. No. 127,078
Claims priority, application Austria, Jul. 9, 1979, 14494
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—229

266,689
FLY SWATTER
Jeffrey F. Seidel, 656 Glendalyn Ave., Spartanburg, S.C. 29302
Filed Sep. 22, 1980, Ser. No. 189,683
Term of patent 14 years
Int. Cl. D22—*06*
U.S. Cl. D22—20

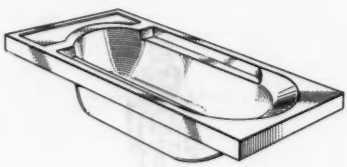
266,690
STACKABLE WATERING CONTAINER
Monte L. Levin, New York, N.Y., assignor to Misco Enterprises Inc., New York, N.Y.
Filed Dec. 5, 1980, Ser. No. 213,574
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—11



266,691
VALVE
Arthur J. Brunet, P.O. Box 451, 101 Pruyn Crescent, Bath, Ontario, Canada
Filed Apr. 8, 1980, Ser. No. 138,446
Claims priority, application Canada, Oct. 23, 1979, 23-10-79-8
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19



266,692
BATHTUB
Jeffrey Harrison, Brookhouse, England, assignor to Kallista Baths, Inc., San Francisco, Calif.
Filed Nov. 20, 1980, Ser. No. 208,804
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—55



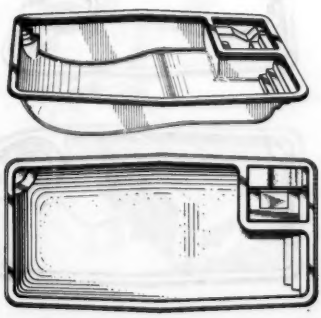
266,693
COAL BURNING STOVE
Richard Leavens, Pownal, Vt.; Arthur Evans, and William F. Fuhrmann, both of Williamstown, Mass., assignors to Mohawk Industries, Inc., Adams, Mass.
Filed Oct. 14, 1980, Ser. No. 196,325
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97

266,694
REAGENT STRIP
David L. Boger, and Kenneth D. Collister, both of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.
Filed Jul. 2, 1980, Ser. No. 165,361
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—8

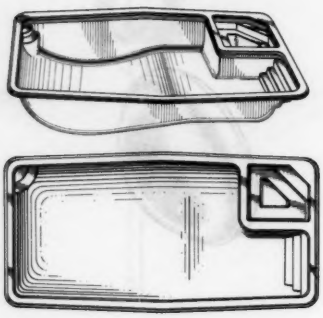
266,695
MOUTHPIECE FOR A SPIROMETER
Wallace E. Trammll, 840 N. 1200 East, Provo, Utah 84601, and James R. Chidester, Rte. 1, Box 150 B, American Fork, Utah 84003
Filed Mar. 28, 1980, Ser. No. 134,982
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—17

266,696
TAXIDERMAL GLASS EYE
John W. Crossley, Box 121, Ottsville, Pa. 18942
Filed May 19, 1980, Ser. No. 151,441
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D24—33

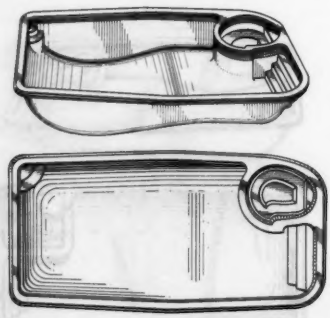
266,697
SWIMMING POOL AND SPA COMBINATION
Lino Z. Topete, 1845 E. San Antonio St., San Jose, Calif. 95116
Filed Nov. 19, 1979, Ser. No. 95,204
Term of patent 14 years
Int. Cl. D24—*01;* D23—*02;* D25—*99*
U.S. Cl. D24—38



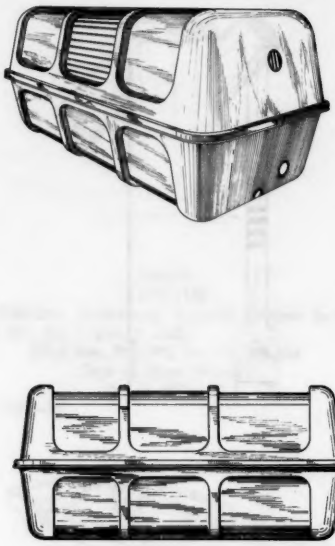
266,698
SWIMMING POOL AND SPA COMBINATION
Lino Z. Topete, 1845 E. San Antonio St., San Jose, Calif. 95116
Filed Jan. 18, 1980, Ser. No. 113,251
Term of patent 14 years
Int. Cl. D24—*01;* D23—*02;* D25—*99*
U.S. Cl. D24—38



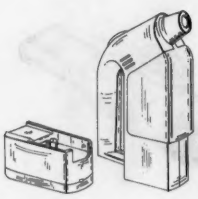
266,699
SWIMMING POOL AND SPA COMBINATION
Lino Z. Topete, 1845 E. San Antonio St., San Jose, Calif. 95116
Filed Mar. 3, 1980, Ser. No. 126,329
Term of patent 14 years
Int. Cl. D24—*01;* D23—*02;* D25—*02*
U.S. Cl. D24—38



266,700
ISOLATION CHAMBER
Gary R. Higgins, Lakewood, Colo., assignor to Float to Relax, Inc., Lakewood, Colo.
Filed Aug. 18, 1981, Ser. No. 293,870
Term of patent 14 years
Int. Cl. D24—*01;* D23—*02*
U.S. Cl. D24—38

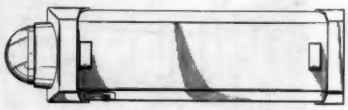


266,701
ULTRASONIC NEBULIZER
Herbert Marloth, Siegertsbrunn, Fed. Rep. of Germany, assignor to Bosch-Siemens Hausgeräte GmbH, Stuttgart, Fed. Rep. of Germany
Filed Apr. 19, 1979, Ser. No. 31,313
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1978, 4916
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—62

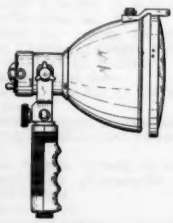


266,702
VAGINAL APPLICATOR
Pierre H. Lagny, Paris, France, assignor to Finepharm Inc., Montreal, Canada
Filed Jun. 12, 1980, Ser. No. 158,984
Claims priority, application Canada, Jan. 4, 1980, 0401805
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—63

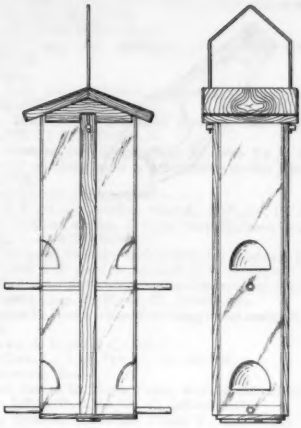
266,703
TORCH
Cheung T. Hoi, Kowloon, Hong Kong, assignor to Freezinhot Bottle Co., Ltd., Kowloon, Hong Kong
Filed Nov. 20, 1979, Ser. No. 96,196
Claims priority, application United Kingdom, May 24, 1979, 990047
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D26—42



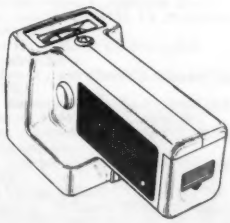
266,704
LAMP
James Frezzolini, and James J. Crawford, both of Ringwood, N.J., assignors to Frezzolini Electronics, Inc., Hawthorne, N.J.
Filed Nov. 10, 1980, Ser. No. 205,889
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D26—44



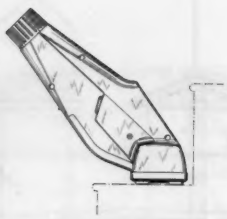
266,705
BIRD FEEDER
Robert E. Bescherer, P.O. Box 23, Bristol, R.I. 02809
Filed Sep. 9, 1980, Ser. No. 185,533
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—15

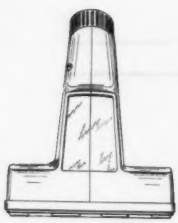


266,706
ELECTRONIC STATIC ELIMINATOR
Masahiro Karaki, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Apr. 30, 1980, Ser. No. 145,088
Claims priority, application Japan, Nov. 2, 1979, 54-46215
Term of patent 14 years
Int. Cl. D7—*05;* D14—*99*
U.S. Cl. D32—01



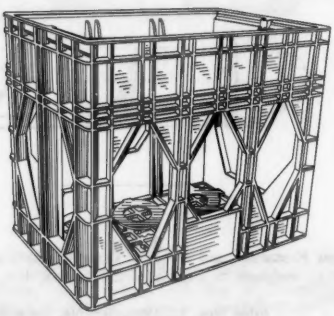
266,707
VACUUM CLEANER TOOL
Roderick F. Bunyea, Cockeysville, Md., assignor to Black & Decker Inc., Newark, Del.
Filed Mar. 26, 1981, Ser. No. 247,828
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D32—33





266,708
MOBILE WOOD CARRIER
Donald C. Jean, Palmer Township, Northampton County, Pa., assignor to Earl C. Clymer, Jr., Phillipsburg and Thomas J. Middleton, Branchburg, both of, N.J., a part interest to each
Filed Sep. 11, 1980, Ser. No. 186,721
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D34—24

266,709
BEVERAGE BOTTLE TRANSPORT CASE
Theodor M. Box, Brielle, N.J., assignor to Cities Service Company, Tulsa, Okla.
Filed Jul. 14, 1980, Ser. No. 168,512
Term of patent 14 years
Int. Cl. D9—*04*
U.S. Cl. D34—40



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 26TH DAY OF OCTOBER, 1982

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A-Betone AB: *See—*
Thomsen, Ove; and Ronnow, Peter, 4,356,269, Cl. 435-316.000.

A. H. Robins Company, Inc.: *See—*
Bryan, Hugh D.; Carter, Judy A.; and Trimble, Donald B., 4,356,209, Cl. 426-627.000.

A. Raymond: *See—*
Besson, Gilbert, 4,355,465, Cl. 30-344.000.

AB Asea-Atom: *See—*
Borrman, Bo; and Engedal, Knud, 4,356,147, Cl. 376-291.000.

AB Volvo: *See—*
Mattson, Erik K.; and Bertil, Hass, 4,356,373, Cl. 219-86.310.

Abel, Edward P.; and Weissberger, Edward, to Eastman Kodak Company. Timing layers and auxiliary neutralizing layer for color transfer assemblages containing positive-working redox dye-releasers. 4,356,249, Cl. 430-215.000.

Abercrombie, William F., Jr.; Colwell, Joey G., Jr.; and Price, Charles R., to J. M. Huber Corporation. Method of increasing the effectiveness of or the effective production rate of a process by integrated feed. 4,356,093, Cl. 210-695.000.

Abrahamsen, Thomas J.: *See—*
Schmitz, Robert E.; Stearns, David T.; Stegmann, Erwin; McWhorter, Thomas E.; Geiger, Warren F.; and Abrahamsen, Thomas J., 4,355,488, Cl. 51-319.000.

Ackerman, Kurt A.: *See—*
Ackerman, Roger A.; and Ackerman, Kurt A., 4,355,595, Cl. 119-14.030.

Ackerman, Roger A.; and Ackerman, Kurt A., to Ackerman, Roger A. Central milking system with reduced stray current problems. 4,355,595, Cl. 119-14.030.

Acoraci, Joseph H., to Bendix Corporation, The. Practical implementation of large Butler matrices. 4,356,461, Cl. 333-116.000.

Acoustic Standards: *See—*
Romano, Paul L., 4,355,678, Cl. 160-332.000.

Adam, Richard E. Device for lifting and loading boxes and cartons, especially from an agricultural field. 4,355,713, Cl. 198-514.000.

Adams Hard-Facing Company, Inc.: *See—*
Wetmore, Halsey J., 4,355,589, Cl. 111-7.000.

Adams, John P.: *See—*
Knott, Jack E., II; Koschak, Matthew S.; and Adams, John P., 4,355,721, Cl. 206-524.200.

Adams, Steven E.: *See—*
Hamilton, Robert H., Jr.; and Adams, Steven E., 4,355,786, Cl. 266-62.000.

Adomeit, Heinz-Dieter, to N.V. Klippan S.A. Fast acting automatic seat belt retractor. 4,355,772, Cl. 242-107.40A.

Advance Transformer Company: *See—*
Feinberg, Albert E., 4,356,431, Cl. 315-101.000.

Adver-Togs, Inc.: *See—*
Price, James E., 4,356,048, Cl. 156-220.000.

Ady, Michael S.; Lufkin, Roger F.; and Lynch, Kevin L. Model rocket propulsion system. 4,355,577, Cl. 102-378.000.

Aeberli, Paul: *See—*
Humphries, Peter; and Aeberli, Paul, 4,356,474, Cl. 340-509.000.

Aerpat A.G.: *See—*
Denham, Keith; Prickett, Leslie R.; and Pallister, Lawrence R., 4,355,934, Cl. 411-38.000.

Afanasiev, Anatoly A.: *See—*
Asinovsky, Erik I.; Afanasiev, Anatoly A.; and Pakhomov, Evgeny P., 4,356,527, Cl. 361-134.000.

Aftergut, Sigfried; and Cole, Herbert S., Jr., to General Electric Company. Dichroic liquid crystal compositions containing anthraquinone-based dyes. 4,356,102, Cl. 252-299.100.

Agatahama, Shunichi, to Omron Tateisi Electronics, Co. Electric contact switching device. 4,356,465, Cl. 335-128.000.

Air Pollution Technology, Inc.: *See—*
Calvert, Seymour, 4,356,009, Cl. 55-90.000.

Air Products and Chemicals, Inc.: *See—*
Schmitz, Robert E.; Stearns, David T.; Stegmann, Erwin; McWhorter, Thomas E.; Geiger, Warren F.; and Abrahamsen, Thomas J., 4,355,488, Cl. 51-319.000.

Aisin Seiki Company Limited: *See—*
Iwasaki, Shinichiro, 4,356,438, Cl. 318-344.000.

Aizawa, Hiroshi: *See—*
Ohniwa, Takehiko; Senuma, Michio; Shimada, Fumio; Saito, Syuichiro; Shigeta, Yoshihiro; and Aizawa, Hiroshi, 4,355,878, Cl. 354-234.000.

Akao, Mutsuo; and Kawata, Tadashi, to Fuji Photo Film Co., Ltd. Wrapping material for photographic light-sensitive material. 4,356,224, Cl. 428-220.000.

Akazawa, Yoji: *See—*
Nakanishi, Yoshiyuki; Akazawa, Yoji; Ikeda, Noriaki; and Suzuki, Takehiko, 4,356,112, Cl. 252-435.000.

Akiyama, Shun-ichi: *See—*
Hatano, Kazunori; Nakamichi, Masanari; and Akiyama, Shun-ichi, 4,356,265, Cl. 435-119.000.

Aktiebolaget P. E. Holmgren: *See—*
Holmgren, Lars; and Holmgren, Per-Martin, 4,355,477, Cl. 37-117.500.

Akzo NV: *See—*
Brink, Ted; and de Graaf, Stephanus A. G., 4,356,281, Cl. 524-397.000.
Zengel, Hans-Georg; Bergfeld, Manfred; and Zielke, Rainer, 4,356,289, Cl. 525-358.000.

Albertazzi, Gastone, to Finike Italiana Marposs S.p.A. Method and apparatus for checking parts of a constant velocity joint. 4,355,467, Cl. 33-143.00L.

Alcan Aluminum Corporation: *See—*
Gailey, J. Lynn; and Wollam, Carl A., 4,356,216, Cl. 427-286.000.
Wollam, Carl A.; Gailey, J. Lynn; and Chalmers, Alexander A., 4,356,217, Cl. 427-286.000.

Alexander, James S., to International Business Machines Corporation. Acoustic hood with glare shield. 4,355,914, Cl. 400-690.100.

Alferness, Clifton A., to Physio-Control Corporation. Multipolar electrode for body tissue. 4,355,642, Cl. 128-642.000.

Alford, Thomas E. Wedge-shaped camping travel trailer. 4,355,834, Cl. 296-15.000.

Alisyncro S.a.s. di Bruno & C.: *See—*
Bruno, Cario L., 4,355,712, Cl. 198-460.000.

Allied Corporation: *See—*
Diamond, Steven E.; Mares, Frank; Muccigrosso, Deborah A.; and Solar, Jeffrey P., 4,356,311, Cl. 549-524.000.
Kavesh, Sheldon; Prevorsek, Dusan C.; and Wang, Donald G., 4,356,138, Cl. 264-164.000.
Largman, Theodore, 4,356,282, Cl. 524-398.000.
Pez, Guido P.; and Mador, Irving L., 4,356,337, Cl. 585-267.000.
Wells, Rodney L.; Rowe, Monty L.; Yates, Samuel L.; and Muller, George R., 4,356,280, Cl. 524-148.000.

Allis-Chalmers Corporation: *See—*
Day, Charles E.; and Putman, William A., 4,356,011, Cl. 55-368.000.

Alstrin, Charles E.: *See—*
Parks, John H.; Alstrin, Charles E.; and King, Dennis M., 4,355,610, Cl. 123-386.000.

Altman, Robert L., to United States of America, National Aeronautics and Space Administration. Synthesis of dawsonites. 4,356,157, Cl. 423-419.00P.

Aluminum Company of America: *See—*
Francis, Thomas L.; Marhanka, John E.; and Heilich, Raymond P., 4,356,271, Cl. 501-84.000.

Amada Company, Limited: *See—*
Kobayashi, Morimasa; and Sakurai, Nobuo, 4,355,555, Cl. 83-62.100.

Amari, Takaaki: *See—*
Imaizumi, Masao; Takezono, Tetsuya; Amari, Takaaki; and Oguchi, Yutaka, 4,356,339, Cl. 585-829.000.

Amberg, Ralph G., to Automated Container Corporation. Composite container and method. 4,355,759, Cl. 229-5.500.

American Can Company: *See—*
Knott, Jack E., II; Koschak, Matthew S.; and Adams, John P., 4,355,721, Cl. 206-524.200.

American Cyanamid Company: *See—*
Loffelman, Frank F.; and Brady, Thomas E., 4,356,287, Cl. 525-204.000.
Szita, Jeno G.; and DiLeone, Roland R., 4,356,304, Cl. 544-196.000.

American Filtrona Corporation: *See—*
Berger, Richard M., 4,355,995, Cl. 493-43.000.

American Hardware & Paint Co., Inc.: *See—*
Josephson, Louis, 4,355,567, Cl. 98-121.00A.

American Hospital Supply Corporation: *See—*
Hofstetter, Jack H., 4,356,012, Cl. 55-385.00C.

AMF Incorporated: *See—*
Volz, Jack H., 4,356,360, Cl. 200-11.00R.

AMP Incorporated: *See—*
Conrad, Lee R.; and Dowling, Edward C., Sr., 4,355,865, Cl. 350-96.230.
Fukukira, Kazutoyo, 4,356,358, Cl. 200-5.00A.
Kock, Konrad, 4,355,862, Cl. 350-96.200.
Kourimsky, Friedrich J. A., 4,355,853, Cl. 339-17.0LM.

Ampex Corporation: *See—*
Lemoine, Maurice G.; and Pasdera, Leonard A., 4,356,518, Cl. 360-51.000.
Yeh, Nan-Hsiung, 4,356,523, Cl. 360-113.000.

Andersen, Roger E., to United States of America, Air Force. Load balancer for multiple loads. 4,355,832, Cl. 294-81.00R.

Anderson Engineers, Inc.: *See*—
Anderson, Harry E.; and Heasley, Raymond E., 4,356,043, Cl. 148-9.00R.

Anderson, Harry E.; and Heasley, Raymond E., to Anderson Engineers, Inc. Cutting tool carrier and method of cutting. 4,356,043, Cl. 148-9.00R.

Anderson, James M.: *See*—
Peterson, Robert V.; Anderson, James M.; Gregonis, Donald E.; Kim, Sunj-Wan; and Feijen, Jan, 4,356,166, Cl. 424-19.000.

Andreev, Vladimir F.: *See*—
Dolzhenkov, Boris S.; Andreev, Vladimir F.; and Pimenov, Vitalii A., 4,355,789, Cl. 266-207.000.

Ankersson, Bill, to Rockwool Aktiebolaget. Method and apparatus for catching a partly fibrated mineral bloom. 4,356,017, Cl. 65-8.000.

Anthony, John; Velisek, Frank J.; and Capponi, Paul D., to Union Carbide Corporation. Melt-extruded multilayer polyethylene bag film. 4,356,221, Cl. 428-35.000.

Antoine, Jacquet M., to Societe Anonyme Francaise du Ferodo. Control device and method for an air conditioning installation of the passenger space in a motor vehicle. 4,355,752, Cl. 237-12.30B.

Antos, Ronald L.: *See*—
Herloski, Robert P.; Norton, James R.; and Antos, Ronald L., 4,355,859, Cl. 350-6.100.
Lavallee, Pierre A.; Marshall, Sidney W.; and Antos, Ronald L., 4,355,860, Cl. 350-6.800.

Aoki, Katsuhiko: *See*—
Katagi, Takashi; Urasaki, Shuji; Ebisui, Takashi; and Aoki, Katsuhiko, 4,356,494, Cl. 343-781.0CA.

Aoki, Yoshitaka: *See*—
Tanaka, Eiichiro; Yano, Kousaku; Aoki, Yoshitaka; and Fujiwara, Shinji, 4,355,866, Cl. 350-164.000.

Aoshima, Atsushi; and Murofushi, Toshiaki, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for producing unsaturated carboxylic esters. 4,356,316, Cl. 560-208.000.

Aotani, Yoshimasa; Kojima, Teruo; and Nakakita, Eiji, to Fuji Photo Film Co., Ltd. Light-sensitive compositions. 4,356,247, Cl. 430-195.000.

Arai, Fuminori: *See*—
Kitajima, Masao; Arai, Fuminori; and Kondo, Asaji, 4,356,149, Cl. 422-56.000.

Arai, Naoki: *See*—
Ikenoue, Tsuneo; Liu, Shin-yng; Umemoto, Shuichi; and Arai, Naoki, 4,356,541, Cl. 363-20.000.

Araya, Abraham: *See*—
Dyer, Alan; and Araya, Abraham, 4,356,156, Cl. 423-328.000.

Arendt, Henry P.; and Heard, Thomas J., to Otis Engineering Corporation. Well system and method. 4,355,686, Cl. 166-313.000.

Armitage, David, to LeVeen, Harry H. Automatic impedance matching apparatus. 4,356,458, Cl. 333-17.00M.

Armstrong, Andrew S.; and Sach, Martin R., to Transcan Video Limited. Apparatus for use in scanning a cinematograph film. 4,356,514, Cl. 358-214.000.

Armstrong, Errol C.; Diaz-Infante, Javier; and Hall, David J., to Bud Antle, Inc. Transplanting machine. 4,355,588, Cl. 111-3.000.

Armstrong, Joe W. Method for making framed structures. 4,355,478, Cl. 40-154.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Aoshima, Atsushi; and Murofushi, Toshiaki, 4,356,316, Cl. 560-208.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Morisawa, Tahei, 4,355,877, Cl. 354-217.000.
Yoshimura, Norihiko; Niiho, Masaaki; Kamasako, Shoji; and Ishiai, Hideyuki, 4,356,513, Cl. 358-213.000.

Asano, Masaharu; Furuhashi, Shoji; and Tamura, Hideyuki, to Nissan Motor Company, Limited. Air/fuel ratio control device for an internal combustion engine. 4,355,615, Cl. 123-437.000.

Asbill, Clarence M., III, to Robertshaw Controls Company. Control panel layout sheet and method of making the same. 4,355,983, Cl. 434-219.000.

Ascoe Felts, Inc.: *See*—
Dufour, Marcel, 4,356,225, Cl. 428-234.000.

ASEA Aktiebolag: *See*—
Brogardh, Torgny; and Engstrom, Olof, 4,356,448, Cl. 324-244.000.
Stenkvist, Sven-Einar, 4,356,340, Cl. 373-107.000.

Ash, Earl M., to United States of America, Army. Lightweight one piece side rack with stakes for flatbed semitrailers. 4,355,835, Cl. 296-36.000.

Ashby, Bruce A.: *See*—
Crivello, James V.; and Ashby, Bruce A., 4,356,050, Cl. 156-273.300.

Asinovsky, Erik I.; Afanasiev, Anatoly A.; and Pakhomov, Evgeny P. Valve arrester. 4,356,527, Cl. 361-134.000.

ASQ Boats, Inc.: *See*—
Lee, Eui-Wan, 4,355,974, Cl. 432-253.000.

Atara Corporation: *See*—
Lipert, Peter, 4,356,131, Cl. 261-77.000.

Ateliers de Constructions Electriques de Charleroi: *See*—
Dufrasne, Jean-Claude; and Thibaut, Jules, 4,356,359, Cl. 200-11.0TC.

Atlantic Richfield Company: *See*—
Lowther, Frank E., 4,355,965, Cl. 418-111.000.
Masologites, George P., 4,355,999, Cl. 44-1.0SR.

Atlas Copco Aktiebolag: *See*—
Gidlund, Per L. A., 4,355,564, Cl. 91-217.000.

Atomic Energy Board: *See*—
Schumann, Werner A., 4,356,005, Cl. 55-17.000.

Aulich, Hubert; and Auracher, Franz, to Siemens Aktiengesellschaft. Cladded optical fiber having a longitudinal side coupling zone. 4,355,863, Cl. 350-96.150.

Auracher, Franz: *See*—
Aulich, Hubert; and Auracher, Franz, 4,355,863, Cl. 350-96.150.

Auriol, Alain; and Tritten, Paul, to Commissariat a l'Energie Atomique. Method of manufacturing supports for porous filters. 4,356,215, Cl. 427-244.000.

Aurora Products Canada Limited: *See*—
Prehodka, Barry V., 4,355,807, Cl. 273-86.00R.

Automated Container Corporation: *See*—
Amberg, Ralph G., 4,355,759, Cl. 229-5.500.

Automation Industries, Inc.: *See*—
Kutnyak, Thomas A.; Desai, Mahendra N.; and Berman, Roy A., 4,356,284, Cl. 524-520.000.

Automobiles Citroen: *See*—
Roger, Raymond, 4,355,534, Cl. 73-35.000.

Automobiles Peugeot: *See*—
Roger, Raymond, 4,355,534, Cl. 73-35.000.

Avery International Corporation: *See*—
Josephy, Karl; and Baggarley, Richard R., 4,356,375, Cl. 219-121.0LH.

B/K Patent Development Company, Inc.: *See*—
Schwab, Pierre P., 4,356,361, Cl. 200-16.00D.

Baba, Toshio: *See*—
Iwao, Junichi; Oya, Masayuki; Baba, Toshio; Iso, Tadashi; and Chiba, Takehisa, 4,356,183, Cl. 424-263.000.

Baba, Yuko: *See*—
Ookubo, Takao; Baba, Yuko; and Kamihama, Kiyoshi, 4,355,848, Cl. 301-37.0SS.

Babcock & Wilcox Company, The: *See*—
Edwards, Gerald T.; and Schluderberg, Donald C., 4,355,449, Cl. 29-426.200.
Mohat, William D., 4,356,403, Cl. 307-60.000.

Bachle, Walter W., to General Signal Corporation. Lay-in lug with conduction pad. 4,355,852, Cl. 339-14.00R.

Backman, Marvin E.: *See*—
Sewell, Robert G. S.; Pringle, John K.; Backman, Marvin E.; and Finnegan, Stephen A., 4,355,562, Cl. 89-36.00A.

Bada, Hajime: *See*—
Morishita, Hitoshi; Bada, Hajime; and Sudo, Fumio, 4,356,032, Cl. 75-52.000.

Badrak, Robert P., to Reed Rock Bit Company. Method of reducing defects in powder metallurgy tungsten carbide elements. 4,356,034, Cl. 75-203.000.

Baer, Ralph H.; and Cope, Leonard D., to Sanders Associates, Inc. Manually programmable video gaming system. 4,355,805, Cl. 273-85.00G.

Baggarley, Richard R.: *See*—
Josephy, Karl; and Baggarley, Richard R., 4,356,375, Cl. 219-121.0LH.

Bahn nee Leugering, Rita, heiress: *See*—
Weinlich, Jurgen; Plewan, Otto; Leugering, Hans-Joachim, deceased; Leugering nee Wegener, Ursula M., heiress; Leugering, Lothar, heir; Leugering, Manfred, heir; Bahn nee Leugering, Rita, heiress; and Leugering, Gunter, heir, 4,356,283, Cl. 524-504.000.

Bahnson Company, The: *See*—
Nijhawan, Pramodh; and Duckworth, Joseph M., 4,356,064, Cl. 202-263.000.

Bailey, Charles L.; and Baker, Roy D., to Eagle-Picher Industries, Inc. Stove having extruded door opening and method of making same. 4,355,626, Cl. 126-190.000.

Bailey, John M., to Caterpillar Tractor Co. Control system and nozzle for impulse turbines. 4,355,949, Cl. 415-35.000.

Bailey, John M., to Caterpillar Tractor Co. Radiant heating apparatus. 4,355,973, Cl. 432-209.000.

Bailey & Sons Company: *See*—
Casady, Dale D., 4,355,746, Cl. 224-274.000.

Bain, David; Martin, John E.; Saul, John H.; and Winterton, Neil, to Imperial Chemical Industries Limited. Stabilization of chlorinated aliphatic hydrocarbons and use of stabilized composition in cleaning articles. 4,356,038, Cl. 134-2.000.

Baines, Eric: *See*—
Harvey, Kenneth; Connors, Stephen T.; and Baines, Eric, 4,356,168, Cl. 424-52.000.

Baker, Alan C.: *See*—
Hockin, Harry W., deceased; Bracanin, Brian F.; Clements, Ronald J.; Keran, Vitie P.; and Baker, Alan C., 4,356,031, Cl. 75-36.000.

Baker Perkins Holdings Limited: *See*—
Stamper, John R., 4,355,972, Cl. 432-148.000.

Baker, Roy D.: *See*—
Bailey, Charles L.; and Baker, Roy D., 4,355,626, Cl. 126-190.000.

Bako, Lazio, to Kidde, Inc. (Presto Lock Company Division). Combination locks. 4,355,524, Cl. 70-312.000.

Balasubramanian, N. Optical inspection device for measuring depthwise variations from a focal plane. 4,355,904, Cl. 356-376.000.

Banba, Kimio. Preserving sperm of domestic animals. 4,356,259, Cl. 435-2.000.

Banner Engineering Corp.: *See*—
Fayfield, Robert W., 4,356,393, Cl. 250-214.00R.

Bar, Vilmos; Boszormenyi, Joszef; Richter, Peter; Mercz, Jeno; and Rozsnyai, Tamas, to Material Vegyipari Szovetkezet; and Human Oltoanyagtermelo es Kutato Intezet. Water-soluble derivatives of 6,6'-methylene-bis-(2,2,4-trimethyl-1,2-dihydroquinoline). 4,356,306, Cl. 546-176.000.

Barber, John P.: *See*—
Kemeny, George A.; and Barber, John P., 4,355,561, Cl. 89-8.000.

Barcaroli, Valerio; DeMichelis, Carlo; Giandonato, Giuseppe; and Giorcelli, Silvano, to CSELT—Centro Studi e Laboratori Telecomunicazioni S.p.A. Device for processing telephone signals, including a processor and a preprocessor sharing a common memory. 4,356,547, Cl. 364-200.000.

Barlett, Salvadore P.; Dougherty, Daniel J.; and Lokuta, Frederick P., to RCA Corporation. Method of forming a mesa in a semiconductor device with subsequent separation into individual devices. 4,355,457, Cl. 29-583.000.

Barmag Barmer Maschinenfabrik: *See*—
Hertell, Siegfried; Kirchherr, Claus; Kahl, Horst; and Hoffmann, Siegfried, 4,355,655, Cl. 137-117.000.

Barnes, Charles A.; Davis, Dean E.; and Wykoff, Carl L., to Clark Equipment Company. Brake and transmission control. 4,355,698, Cl. 180-273.000.

Bartels, James I., to Honeywell Inc. Conductive fluid probe powering means. 4,356,406, Cl. 307-118.000.

Barten, Piet G. J.; and Bos, Johannes J., to U.S. Philips Corporation. Picture display device. 4,356,436, Cl. 315-386.000.

Barth, Wayne E., to Pfizer Inc. Beta-lactamase inhibiting 2-beta-substituted-2-alpha-methyl-(5R)penam-3-alpha-carboxylic acid 1,1-dioxides and intermediates therefor. 4,356,174, Cl. 424-114.000.

Bartizal, John J., Jr. Sheet stream sensing and control device. 4,355,799, Cl. 271-151.000.

Bartlett, Joel F.: *See*—
Katzman, James A.; Bartlett, Joel F.; Bixler, Richard M.; Davidow, William H.; Despotakis, John A.; Graziano, Peter J.; Green, Michael D.; Greig, David A.; Hayashi, Steven J.; Mackie, David R.; McEvoy, Dennis L.; Treybig, James G.; and Wierenga, Steven W., 4,356,550, Cl. 364-200.000.

Bartlett, Robert W.: *See*—
Sanjurjo, Angel; Rowcliffe, David J.; and Bartlett, Robert W., 4,356,141, Cl. 264-332.000.

Bartow, Richard J., to Clark Equipment Company. Upright for lift truck. 4,355,703, Cl. 187-9.00E.

BASF Aktiengesellschaft: *See*—
Lotsch, Wolfgang, 4,356,123, Cl. 260-326.00N.

Bates, Victor T., to Fansteel Inc. In situ phosphorus addition to tantalum. 4,356,028, Cl. 75-0.5AB.

Bathellier, Andre; and Ginisty, Claude, to Commissariat a l'Energie Atomique. Uranium recovery process. 4,356,153, Cl. 423-10.000.

Battelle-Institut e.V.: *See*—
Weisser, Gunter; Starkloff, Bernd; and Stoesser, Klaus, 4,355,908, Cl. 374-39.000.

Battocletti, Frank E., to TransData, Inc. Time division multiplier transducer with selective phase shift. 4,356,446, Cl. 324-83.00R.

Baucom, Keith B., to United States of America, Air Force. Method for synthesizing poly(carbonyl fluoride) oligomers. 4,356,070, Cl. 204-158.00R.

Bavoux, Robert J. A.; Lemaire, Francis R. J.; and Salkazanov, Pierre, to Compagnie Internationale pour l'Informatique Cii-Honeywell Bull (Societe Anonyme). Process and data system using data extensions. 4,356,548, Cl. 364-200.000.

Baxter Travenol Laboratories, Inc.: *See*—
Cobean, Richard W.; Wicnienski, Michael F.; and Feldman, Gary, 4,356,394, Cl. 250-222.00R.

Bayer Aktiengesellschaft: *See*—
Dickore', Karlfried; and Kuhle, Engelbert, 4,356,024, Cl. 71-93.000.
Hoffmann, Hellmut, 4,356,127, Cl. 260-464.000.
Hucks, Uwe; Tresper, Erhard; and Wulff, Claus, 4,356,129, Cl. 260-973.000.
Reinehr, Ulrich; Hoffmann, Peter; and Kleinschmidt, Peter, 4,356,134, Cl. 264-49.000.
Wagner, Kuno; Dahm, Manfred; and Muller, Hanns P., 4,356,275, Cl. 521-136.000.

Bayly, Donald L.: *See*—
Coffey, Clayton G.; Murray, Stephen B.; and Bayly, Donald L., 4,355,507, Cl. 60-39.500.

BBC Brown, Boveri & Company, Limited: *See*—
Perregaux, Alain; and Bunschi, Toni, 4,355,868, Cl. 350-338.000.
Schwarzenbach, Alfred, 4,355,923, Cl. 405-59.000.

Bearden, Fred B., Jr.: *See*—
Martin, Edward W.; Meyers, Kenneth R.; and Tucker, Fred E., III, 4,355,570, Cl. 99-446.000.

Beaudry, Jean. Portable shelter. 4,355,650, Cl. 135-7.10R.

Beck, Harold K., to Halliburton Services. Ball operated J-slot. 4,355,685, Cl. 166-240.000.

Beckman Instruments, Inc.: *See*—
Kaye, Wilbur I., 4,355,897, Cl. 356-338.000.

Beermann, Heinrich: *See*—
Boer, Joachim; and Beermann, Heinrich, 4,356,419, Cl. 310-217.000.

Beers, Melvin D., to General Electric Company. Devolatilized room temperature vulcanizable silicone rubber composition. 4,356,116, Cl. 524-837.000.

Beery, Jay D., to Sheffer Collet Company. Double acting internal diameter gripping chucks. 4,355,816, Cl. 279-2.00R.

Beha, Christian. Electronic voltage and continuity testing unit. 4,356,442, Cl. 324-51.000.

Beitner, Shlomo, to Bipol Ltd. Refrigerator-vehicle combination method. 4,355,518, Cl. 62-3.000.

Bell, Leo A.; and Terbrack, William H., to Cooper Industries, Inc. Winch drum cable length measurement apparatus. 4,356,557, Cl. 364-562.000.

Bell Telephone Laboratories, Incorporated: *See*—
Candy, James C.; and Wooley, Bruce A., 4,356,559, Cl. 364-724.000.
Eng, Kai Y.; and Yue, On-Ching, 4,356,353, Cl. 179-15.55T.
Lovinger, Andrew J.; and Sharpe, Louis H., 4,356,505, Cl. 357-72.000.

Bellco Glass Inc.: *See*—
Ono, K. Ray, 4,355,906, Cl. 366-274.000.

Belyakov, Viktor P.; Bronshtein, Alexandr S.; and Kortikov, Viktor S. Mass-transfer apparatus. 4,356,132, Cl. 261-114.0TC.

Bendix Corporation, The: *See*—
Acoraci, Joseph H., 4,356,461, Cl. 333-116.000.
Bunger, Dennen J., 4,355,917, Cl. 403-24.000.
Casey, Gary L., 4,355,606, Cl. 123-327.000.
Mayer, Endre A., 4,355,661, Cl. 137-881.000.
Rode, Melvin A.; and Toelle, Alvin D., 4,355,613, Cl. 123-414.000.
Whiteside, Arliss E.; Freedman, Morris D.; Rothschild, Alexander M.; and Tasar, Omur, 4,356,546, Cl. 364-200.000.
Wilkinson, John R., 4,355,619, Cl. 123-490.000.

Benedyk, Joseph C., to Brunswick Corporation. Artificial turf-like product of thermoplastic polymers. 4,356,220, Cl. 428-17.000.

Bengt Petersson New Products Investment AB: *See*—
Hagelberg, Gabriella, 4,355,718, Cl. 206-312.000.

Benko, Janos: *See*—
Szendro, Peter; Benko, Janos; and Szabo, Imre, 4,355,989, Cl. 474-94.000.

Benthin, Frank: *See*—
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Beretta, Paolo: *See*—
Leichter, Louis M.; Sonnonstine, Terry J.; Stofko, John J., Jr.; and Beretta, Paolo, 4,356,244, Cl. 430-82.000.

Berger, Peter: *See*—
Orths, Kurt; Lampic, Milan; Berger, Peter; Muller, Jorg; and Loblich, Herbert, 4,355,907, Cl. 374-26.000.

Berger, Richard M., to American Filtrona Corporation. Tobacco smoke filter providing tobacco flavor enrichment, and method for producing same. 4,355,995, Cl. 493-43.000.

Bergfeld, Manfred: *See*—
Zengel, Hans-Georg; Bergfeld, Manfred; and Zielke, Rainer, 4,356,289, Cl. 525-358.000.

Bergland, Paul W., to Bobst Champlain, Inc. Sheet handling device. 4,355,795, Cl. 270-58.000.

Bergsma, Wijtse, to U.S. Philips Corporation. Shaving apparatus. 4,355,464, Cl. 30-34.100.

Bergstein, Wolfgang; Kleemann, Axel; and Martens, Jurgen. Optically active 1,2-bis-(diphenylphosphine)-compounds. 4,356,324, Cl. 568-17.000.

Berkman, Samuel; Duffy, Michael T.; and Temple, Harold E., to RCA Corporation. Silicon melting crucible. 4,356,152, Cl. 422-248.000.

Berman, Roy A.: *See*—
Kutnyak, Thomas A.; Desai, Mahendra N.; and Berman, Roy A., 4,356,284, Cl. 524-520.000.

Berner, Vincent A., to Pennwalt Corporation. Amalgam carrier with unitary spring lever member. 4,355,976, Cl. 433-83.000.

Bernhart, Claude: *See*—
Demarne, Henri; Bernhart, Claude; and Lansen, Jacqueline, 4,356,177, Cl. 424-248.540.

Berrio de la Fe, Alicia. Cigarette case. 4,355,716, Cl. 206-90.000.

Berry, David J.: *See*—
Stoeckli, Oscar W.; and Berry, David J., 4,355,571, Cl. 99-485.000.

Berry, Jean-Luc, to Gie Valpron. Continuous press for dehydrating pulps. 4,355,573, Cl. 100-121.000.

Bertil, Hass: *See*—
Mattson, Erik K.; and Bertil, Hass, 4,356,373, Cl. 219-86.310.

Bertoli, Luciano, to Mesdan S.p.A. Device for splicing textile yarns with the aid of compressed air. 4,355,498, Cl. 57-22.000.

Besson, Gilbert, to A. Raymond. Handles for household utensils. 4,355,465, Cl. 30-344.000.

Bethea, Tristram W.; and Futamura, Shingo, to Firestone Tire & Rubber Company, The. Thermoplastic elastomer blends of a nitrile rubber and a crystalline polyamide mixture. 4,356,286, Cl. 525-183.000.

Bettarini, Franco; Massardo, Pietro; Piccardi, Paolo; and Longoni, Angelo, to Montedison S.p.A. Hydroquinone ethers having juvenile hormone activity. 4,356,329, Cl. 568-637.000.

Beyerle, Rudi: *See*—
Schonafinger, Karl; Beyerle, Rudi; Mogilev, Anton; Bohn, Helmut; Just, Melitta; Martorana, Piero A.; and Nitz, Rolf-Eberhard, 4,356,178, Cl. 424-248.540.

Bhojwani, Arju H.: *See*—
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Bianchetta, Donald L., to Caterpillar Tractor Co. Fluid circuit with zero leak load check and by-pass valve. 4,355,565, Cl. 91-518.000.

Bibeau, Lawrence J.: *See*—
Marino, Jerry C.; and Bibeau, Lawrence J., 4,356,531, Cl. 361-384.000.

BICC Limited: *See*—
Verne, Stefan, 4,356,342, Cl. 174-23.00C.

Bihl, Claudia J.; and Molloy, Michael C., to Jung Products, Inc. Adjustable arm sling with pouch. 4,355,635, Cl. 128-94.000.

Biller, Cleveland J., to United States of America, Agriculture. Intermediate support for a skyline logging system. 4,355,727, Cl. 212-121.000.

Bingham, D. Michael. Club and club holder. 4,355,804, Cl. 273-84.00R.

Bipol Ltd.: *See*—
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Birkmeyer, William J., to PPG Industries, Inc. Reaction products of a polyglycidyl ether of a polyphenol and an amino acid and aqueous solubilized products therefrom. 4,356,277, Cl. 523-406.000.
Bixler, Richard M.: *See*—
Katzman, James A.; Bartlett, Joel F.; Bixler, Richard M.; Davidow, William H.; Despotakis, John A.; Graziano, Peter J.; Green, Michael D.; Greig, David A.; Hayashi, Steven J.; Mackie, David R.; McEvoy, Dennis L.; Treybig, James G.; and Wierenga, Steven W., 4,356,550, Cl. 364-200.000.
Bjorn, Thomas E.; and Kao, Mark C. C., to Stewart-Warner Corporation. Pressure sensor and regulator for airless material coating system. 4,355,761, Cl. 239-126.000.
BL Cars Limited: *See*—
Poole, Joseph J.; and Strange, Victor E., 4,355,547, Cl. 74-690.000.
Black Clawson Company, The: *See*—
Hatton, Derald R.; and Chupka, David E., 4,356,084, Cl. 209-211.000.
Blackmun, Wayne E.: *See*—
Koppelmann, Eldo K.; and Blackmun, Wayne E., 4,355,932, Cl. 408-188.000.
Blackwell, Henry W., to Dresser Industries, Inc. Bowl and slips assembly with improved slip inserts. 4,355,443, Cl. 24-263.00D.
Blaney, Peter G., to Zemco, Inc. Safety disengagement device for automotive speed control system. 4,355,607, Cl. 123-350.000.
Blasbalg, Morton L. Bird feeder construction. 4,355,597, Cl. 119-51.00R.
Blenke, Joseph F.; and Blenke, Stanley J., Sr., to U.S. Foam Mfg. Co., Inc. Air power motor. 4,355,508, Cl. 60-416.000.
Blenke, Stanley J., Sr.: *See*—
Blenke, Joseph F.; and Blenke, Stanley J., Sr., 4,355,508, Cl. 60-416.000.
Bleuer, Keith T. Multiple color single gun TV picture tube. 4,356,434, Cl. 315-375.000.
Bliss, George N.: *See*—
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Blytas, George C.; and Diaz, Zaida, to Shell Oil Company. Sulfur process. 4,356,155, Cl. 423-226.000.
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Miller, Glen E., 4,356,395, Cl. 250-227.000.
Boer, Joachim; and Beermann, Heinrich, to Kraftwerk Union Aktiengesellschaft. Apparatus for fastening an air gap winding. 4,356,419, Cl. 310-217.000.
Boettcher, Charles E., to National Semiconductor Corporation. Method of manufacture for self-aligned floating gate memory cell. 4,355,455, Cl. 29-571.000.
Bogner, Richard D. Disc-on-rod end-fire microwave antenna. 4,356,493, Cl. 343-702.000.
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Schonafinger, Karl; Beyerle, Rudi; Mogilev, Anton; Bohn, Helmut; Just, Melitta; Martorana, Piero A.; and Nitz, Rolf-Eberhard, 4,356,178, Cl. 424-248.540.
Bokelman, Gordon H.; and Gooden, Dewitt J., III, to Philip Morris, Incorporated. Method of curing tobacco. 4,355,648, Cl. 131-290.000.
Boldt, Wesley H. Method of massaging meat products. 4,356,206, Cl. 426-519.000.
Bond, James M.; and Dail, Robert P. Can press implement for canned food products. 4,355,574, Cl. 100-234.000.
Bone, Rainer: *See*—
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Boniolo, Antonio: *See*—
Callegaro, Lanfranco; Boniolo, Antonio; Denti, Ennio; Rosa, Umberto; and Rossi, Valdano, 4,356,267, Cl. 435-179.000.
Booker, Robert A.: *See*—
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Boon, Wyndham H.; and Sid-Ahmed, Abdel-Hadi, to Goodyear Tire & Rubber Company, The. Treated yarn, method of preparation and rubber/cord composite. 4,356,219, Cl. 427-386.000.
Borden, Peter G.; and Saxena, Ram R., to Varian Associates, Inc. Cascade solar cell having conductive interconnects. 4,356,341, Cl. 136-249.000.
Borg, Bernt V.: *See*—
Lewis, Roy D.; and Borg, Bernt V., 4,355,495, Cl. 53-579.000.
Borg-Warner Corporation: *See*—
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Kountz, Kenneth J.; and Norbeck, Dean K., 4,355,948, Cl. 415-1.000.
Borrman, Bo; and Engedal, Knud, to AB Asea-Atom. Fluid tight and thermally insulated coupling assembly. 4,356,147, Cl. 376-291.000.
Borst, Gaylord M.; and Walsworth, Frank J., to Outboard Marine Corporation. Marine propulsion device with self-centering steering mechanism. 4,355,985, Cl. 440-51.000.
Bos, Johannes J.: *See*—
Barten, Piet G. J.; and Bos, Johannes J., 4,356,436, Cl. 315-386.000.
Boschulte, Rainer; Koehnecke, Heinrich; and Muecke, Siegfried, to Siemens Aktiengesellschaft. Device for the signal-technical secure control and monitoring of electrical loads. 4,356,485, Cl. 340-825.170.
Bosshard, Ernst, to Sulzer Brothers Limited. Rack for storing bundles of nuclear fuel elements. 4,356,062, Cl. 376-272.000.
Bosshard, Hans: *See*—
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Boszormenyi, Joszef: *See*—
Bar, Vilmos; Boszormenyi, Joszef; Richter, Peter; Mercz, Jeno; and Rozsnyai, Tamas, 4,356,306, Cl. 546-176.000.
Bottamiller, Wilbert O.; and Spector, George. Shelf builders. 4,355,585, Cl. 108-153.000.
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Bowman, David F., to RCA Corporation. Circuit for frequency scan antenna element. 4,356,462, Cl. 333-128.000.
Bowman, Harold L. Automatic filter network protection, failure detection and correction system and method. 4,356,007, Cl. 55-213.000.
Bracanin, Brian F.: *See*—
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Bracker AG: *See*—
Ramseier, Paul; and Burkhalter, Hans, 4,355,665, Cl. 139-96.000.
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Brady, Thomas E.: *See*—
Loffelman, Frank F.; and Brady, Thomas E., 4,356,287, Cl. 525-204.000.
Brandes, Siegfried; Pesch, Henri-Emile; and Gutsch, Uwe, to Hochtemperatur-Reaktorbau GmbH. Process for loading the reactor cavity of a nuclear reactor. 4,356,145, Cl. 376-265.000.
Brandt, Michael W. Pesticide spray system. 4,355,763, Cl. 239-302.000.
Bray, David W.; David, John L.; and Ferris, Erman E., to General Electric Company. Transmission frequency diversity radar. 4,356,490, Cl. 343-17.20R.
Bray, Steven C.: *See*—
Keramati, Bahram; Bray, Steven C.; and Wood, Ralph T., 4,356,382, Cl. 219-297.000.
Brennen, Michael B.: *See*—
Putman, Thomas H.; Gyugyi, Laszlo; and Brennen, Michael B., 4,356,441, Cl. 323-210.000.
Brew, James K., to Dayco Corporation. Covered V-belt having reduced coefficient of friction sides and method of making the same. 4,355,994, Cl. 474-270.000.
Bridgestone Tire Company Limited: *See*—
Fukuda, Yuji; and Kajigaya, Shinichi, 4,355,792, Cl. 267-153.000.
Bridgnell, David G.; and Jacobsen, Frederick W., to Garrett Corporation, The. Heat exchanger mounting device. 4,355,780, Cl. 248-675.000.
Brima, Thomas S., to National Distillers & Chemical Corp. Process for preparing gamma-butyrolactone and butenolide. 4,356,310, Cl. 549-295.000.
Brink, Ted; and de Graaf, Stephanus A. G., to Akzo NV. Polyethylene terephthalate molding composition having reduced flammability, and molded products made therefrom. 4,356,281, Cl. 524-397.000.
Bristol Corporation: *See*—
Hostetler, Thomas E.; and Ellis, Ted J., Jr., 4,356,369, Cl. 200-334.000.
British Aluminum Company Limited: *See*—
Wilkins, Rennie F. T., 4,355,679, Cl. 164-466.000.
Broadt, David R.; and Shaffer, John W., to GTE Products Corporation. Vented multi-lamp photoflash unit. 4,355,971, Cl. 431-359.000.
Brodnyan, John G.; De Witt, Walter G., III; Gill, Robert A.; and Stelling, Gary D., to Rohm and Haas Company. Bonded nonwoven fabrics suitable for diaper coverstock. 4,356,229, Cl. 428-288.000.
Brogardh, Torgny; and Engstrom, Olof, to ASEA Aktiebolag. Apparatus for measuring electrical or magnetic fields by absorption spectrum change. 4,356,448, Cl. 324-244.000.
Bronshtein, Alexandr S.: *See*—
Belyakov, Viktor P.; Bronshtein, Alexandr S.; and Kortikov, Viktor S., 4,356,132, Cl. 261-114.0TC.
Brooks, Herbert; and Waite, Frederick A., to Imperial Chemical Industries Limited. Copolymers. 4,356,003, Cl. 44-62.000.
Brooks, Peter L.: *See*—
Cook, Paul M.; Otte, Richard F.; Claypool, James L.; White, Lawrence J.; Broyles, Harry C.; and Brooks, Peter L., 4,355,664, Cl. 138-110.000.
Brosch, Eric J.; and Sterrett, William H., to Manville Service Corporation. Cooling tube alignment means and process therefor. 4,356,016, Cl. 65-1.000.
Brother Kogyo Kabushiki Kaisha: *See*—
Itoh, Minoru; and Sasaki, Toshio, 4,355,591, Cl. 112-225.000.
Brotzmann, Karl; and Mantey, Paul, to Eisenwerk-Gesellschaft Maximilianshutte. Steelmaking process. 4,356,035, Cl. 75-52.000.
Brown, Charles K. Solid fuel gasification system. 4,355,586, Cl. 110-229.000.
Brown, David L.; and Miller, Victor D., Jr., to Westinghouse Electric Corp. Combustion turbine vane assembly. 4,355,952, Cl. 415-115.000.
Brown, Ralph D.: *See*—
Cohen, Albert; Brown, Ralph D.; and Scott, William D., 4,355,515, Cl. 60-657.000.
Brown, Samuel J.; and Lorenz, Jerome L., to Essex Group, Inc. Electromagnetic solenoid relay. 4,356,466, Cl. 335-203.000.
Broyles, Harry C.: *See*—
Cook, Paul M.; Otte, Richard F.; Claypool, James L.; White, Lawrence J.; Broyles, Harry C.; and Brooks, Peter L., 4,355,664, Cl. 138-110.000.

Bruckner, Ronald L.; Khamare, Ishwar S.; Voyer, Joseph L.; Hamilton, Rodney V.; and Gheorghiu, Paul, to NCR Corporation. Digital controller. 4,356,542, Cl. 363-26.000.

Brunn, Hansjoachim: *See*—
Klaus, Helmuth; Lause, Heinz; and Brunn, Hansjoachim, 4,355,988, Cl. 474-91.000.

Bruno, Carlo L., to Alisyncro S.a.s. di Bruno & C. Apparatus for feeding products to a work station. 4,355,712, Cl. 198-460.000.

Brunswick Corporation: *See*—
Benedyk, Joseph C., 4,356,220, Cl. 428-17.000.

Bryan, Hugh D.; Carter, Judy A.; and Trimble, Donald B., to A. H. Robins Company, Inc. Food coloring and flavoring agent from defatted wheat germ. 4,356,209, Cl. 426-627.000.

Buck, Gordon H.; Cayley, Paul W., Jr.; Hardwick, Martha K.; and Shoff, Daniel J., to Mattel, Inc. Electronic jacks game. 4,355,806, Cl. 273-85.00G.

Buckau-Walther AG: *See*—
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Bud Antle, Inc.: *See*—
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Budd Company, The: *See*—
Eggert, Walter S., Jr., 4,355,583, Cl. 105-199.0CB.
Germer, John A., 4,355,582, Cl. 105-164.000.

Bunger, Dennen J., to Bendix Corporation, The. Starter jaw coupling fastener. 4,355,917, Cl. 403-24.000.

Bunschi, Toni: *See*—
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Burkes, William M., Jr.; and Miller, William H., to Hercules Incorporated. Nozzle/valve device for a ducted rocket motor. 4,355,663, Cl. 138-44.000.

Burkhalter, Hans: *See*—
Ramseier, Paul; and Burkhalter, Hans, 4,355,665, Cl. 139-96.000.

Burns, Carmen D., to National Semiconductor Corporation. Process for hermetically encapsulating semiconductor devices. 4,355,463, Cl. 29-827.000.

Burns, Richard D.: *See*—
Moodie, Eldon E.; and Burns, Richard D., 4,356,051, Cl. 156-459.000.

Burr-Brown Research Corporation: *See*—
Graeme, Jerald G., 4,356,379, Cl. 219-209.000.

Burri, Peter, to Ciba-Geigy Corporation. Pressure-sensitive or heat-sensitive recording material. 4,355,823, Cl. 282-27.500.

Burroughs Wellcome Co.: *See*—
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Butz, Robert F.: *See*—
Findlay, John W. A.; Butz, Robert F.; and Welch, Richard M., 4,356,165, Cl. 424-1.000.

Buzzell, John G., to Du Pont de Nemours, E. I., and Company. Photoimaging process for forming multicolor images. 4,356,253, Cl. 430-291.000.

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Hammer, Klaus-Dieter; Heinrich, Wolfgang; Gerigk, Guenter; and Bytzek, Max, 4,356,199, Cl. 426-105.000.
Hammer, Klaus-Dieter; Heinrich, Wolfgang; Gerigk, Guenter; and Bytzek, Max, 4,356,200, Cl. 426-105.000.

C.M. Industries: *See*—
Demarne, Henri; Bernhart, Claude; and Lansen, Jacqueline, 4,356,177, Cl. 424-248.540.

Cain, Lester L., to Warren Automatic Tool Company. Method and apparatus for controlling back pressure. 4,355,784, Cl. 251-63.000.

Caines, Ronald S., to Dow Chemical Company, The. Uniaxially compressed vermicular expanded graphite for heat exchanging. 4,355,684, Cl. 165-154.000.

Cairns, Angus H.; Houston, Nicholas J.; and Stephens, Noel W. F., to Coal Industry (Patents) Limited. Survey systems. 4,355,895, Cl. 356-141.000.

Calini, Pierangelo: *See*—
Roffia, Paolo; Calini, Pierangelo; and Tonti, Sergio, 4,356,319, Cl. 562-414.000.

Callegaro, Lanfranco; Boniolo, Antonio; Denti, Ennio; Rosa, Umberto; and Rossi, Valdano, to Sorin Biomedica S.p.A. Enzyme immobilization in cellulosic hollow fibres. 4,356,267, Cl. 435-179.000.

Calvert, Seymour, to Air Pollution Technology, Inc. Gas scrubber and related method. 4,356,009, Cl. 55-90.000.

Cameron Iron Works, Inc.: *See*—
Leicht, Frederick M., 4,355,825, Cl. 285-3.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See*—
Coffey, Clayton G.; Murray, Stephen B.; and Bayly, Donald L., 4,355,507, Cl. 60-39.500.

Canadian Patents & Development Ltd.: *See*—
Jennings, Harold J.; and Lugowski, Czeslaw, 4,356,170, Cl. 424-92.000.

Candy, James C.; and Wooley, Bruce A., to Bell Telephone Laboratories, Incorporated. Logic arrangement for recursive digital filter. 4,356,559, Cl. 364-724.000.

Canon Denshi Kabushiki Kaisha: *See*—
Ohniwa, Takehiko; Senuma, Michio; Shimada, Fumio; Saito, Syuichiro; Shigeta, Yoshihiro; and Aizawa, Hiroshi, 4,355,878, Cl. 354-234.000.

Canon Kabushiki Kaisha: *See*—
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Honda, Haruhisa; Toyono, Tsutomu; Nakamura, Shunji; Tanaka, Kano; and Kimura, Yoshimasa, 4,355,884, Cl. 355-14.0CH.
Hosono, Nagao; Kinoshita, Koichi; and Takahashi, Toru, 4,356,245, Cl. 430-122.000.
Nagashima, Nao, 4,355,885, Cl. 355-14.0CH.
Ohniwa, Takehiko; Senuma, Michio; Shimada, Fumio; Saito, Syuichiro; Shigeta, Yoshihiro; and Aizawa, Hiroshi, 4,355,878, Cl. 354-234.000.

Capponi, Paul D.: *See*—
Anthony, John; Velisek, Frank J.; and Capponi, Paul D., 4,356,221, Cl. 428-35.000.

Carcia, Peter P., to Polaroid Corporation. Photographic control system for varying both flash fire aperture and exposure termination in correspondence with film speed. 4,355,873, Cl. 354-27.000.

Cardellini, Claudio B. Loose leaf binder. 4,355,916, Cl. 402-41.000.

Cardone, Michele; Grandini, Angelo; and Zaramella, Bruno, to Magento Tecnica di Cardone Michele & C.S.n.c. Magnetic workholding device. 4,356,467, Cl. 335-295.000.

Carey, James J., to Chloride Electro Networks, Division of Chloride, Inc., N. American Operation. Metal-plastic header assembly. 4,356,344, Cl. 174-52.00S.

Cargnel, Louis A.: *See*—
Sprengling, Gerhard R.; and Cargnel, Louis A., 4,356,237, Cl. 428-404.000.

Carl Cloos Schweisstechnik GmbH: *See*—
Cloos, Erwin; Schmidt, Manfred; Kring, Helmut; Schnell, Gerhard; and Thielmann, Joachim, 4,356,378, Cl. 219-124.100.

Carl Freudenberg, Firma: *See*—
Yamazaki, Hiroaki; and Hasegawa, Takao, 4,356,046, Cl. 156-86.000.

Carlier, Claude. Control and locking of pivoting needle for pneumatic pipe carriers. 4,355,930, Cl. 406-182.000.

Carlson, William P.: *See*—
Slavik, William H.; Carlson, William P.; and McGowan, Michael J., 4,355,984, Cl. 434-335.000.

Carnation Company: *See*—
Stapley, Ronald B., 4,355,593, Cl. 119-1.000.

Carrier Corporation: *See*—
Miller, Charlie D., 4,355,450, Cl. 29-426.500.

Carroll, James C.; and Lefebvre, Paul R., to Phillips Petroleum Company. Egg supporting tray. 4,355,731, Cl. 217-26.500.

Carron, Mark S.; La Barbera, Ronald S.; Van Brocklin, Lester P.; and Jain, Pawan K., to Stauffer Chemical Company. Treating the residue from the production of phosphorochloridothionates. 4,356,130, Cl. 260-989.000.

Carson, James W. Production tube bending machine. 4,355,525, Cl. 72-149.000.

Carstab Corporation: *See*—
Molt, Kenneth R., 4,356,279, Cl. 524-102.000.

Carter, Judy A.: *See*—
Bryan, Hugh D.; Carter, Judy A.; and Trimble, Donald B., 4,356,209, Cl. 426-627.000.

Casady, Dale D., to Bailey & Sons Company. Golf bag holder for use with golf cars. 4,355,746, Cl. 224-274.000.

Case Engineering Consulting Company: *See*—
Case, George A., 4,356,075, Cl. 204-213.000.

Case, George A., to Case Engineering Consulting Company. Rigid dangler assembly for electroplating barrels. 4,356,075, Cl. 204-213.000.

Casey, Gary L., to Bendix Corporation, The. Idle speed control valve. 4,355,606, Cl. 123-327.000.

Caskey, Margaret: *See*—
Jernigan, Doyle D.; and Caskey, Margaret, 4,355,808, Cl. 273-169.000.

Cassella Aktiengesellschaft: *See*—
Schonafinger, Karl; Beyerle, Rudi; Mogilev, Anton; Bohn, Helmut; Just, Melitta; Martorana, Piero A.; and Nitz, Rolf-Eberhard, 4,356,178, Cl. 424-248.540.

Caterpillar Tractor Co.: *See*—
Bailey, John M., 4,355,949, Cl. 415-35.000.
Bailey, John M., 4,355,973, Cl. 432-209.000.
Bianchetta, Donald L., 4,355,565, Cl. 91-518.000.
Frantzreb, John G., Sr., 4,355,680, Cl. 164-484.000.
Niles, Albert B., 4,356,091, Cl. 210-354.000.
Parks, John H.; Alstrin, Charles E.; and King, Dennis M., 4,355,610, Cl. 123-386.000.
Rodibaugh, Scott A.; and Cobb, Delwin E., 4,355,964, Cl. 418-76.000.
Ruseff, Walter Z., 4,355,510, Cl. 60-452.000.

Cavalla, John F., to John Wyeth & Brother Limited. Thiazoles. 4,356,185, Cl. 424-270.000.

Cayley, Paul W., Jr.: *See*—
Buck, Gordon H.; Cayley, Paul W., Jr.; Hardwick, Martha K.; and Shoff, Daniel J., 4,355,806, Cl. 273-85.00G.

CBS Inc.: *See*—
Goldberg, Abraham A.; and Rossi, John P., 4,356,507, Cl. 358-13.000.

Cedar Dunes Investments Ltd.: *See*—
Cooke, George, 4,355,602, Cl. 122-235.00R.

CEM Compagnie Electro Mecanique: *See*—
Mercuzot, Dominique, 4,356,420, Cl. 310-239.600.

Censor Patent- Und Versuchs-Anstalt: *See*—
Mayer, Herbert E.; and Loebach, Ernst W., 4,355,892, Cl. 355-77.000.

Ceperley, Peter H. Resonant travelling wave heat engine. 4,355,517, Cl. 60-721.000.

Cerberus AG: *See*—
Muggli, Jurg; and Muller, Peter, 4,356,478, Cl. 340-593.000.

CGR Compania Generale de Radiologia: *See*—
Villa, Francisco, 4,355,798, Cl. 271-21.000.
Chagnon, Mark S., to Ferrofluidics Corporation. Stable ferrofluid compositions and method of making same. 4,356,098, Cl. 252-62.510.
Chaibongsai, Sampao. Shrouded valve for internal combustion engine. 4,355,604, Cl. 123-188.0VA.
Challener, Ronald T.; and Rolls, George H., to Oil Mop (U.K.) Limited. Recovery of oil. 4,356,089, Cl. 210-242.400.
Chalmers, Alexander A.: *See*—
Wollam, Carl A.; Gailey, J. Lynn; and Chalmers, Alexander A., 4,356,217, Cl. 427-286.000.
Champion International Corporation: *See*—
Faller, Rudolph A., 4,355,755, Cl. 229-2.50R.
Lavery, John J., 4,355,758, Cl. 229-39.00R.
Roccaforte, Harry I., 4,355,757, Cl. 229-33.000.
Chappell, Christopher L., to Leigh Interests Limited. Solid waste derived fuel. 4,356,000, Cl. 44-1.00D.
Charles Stark Draper Laboratory, Inc., The: *See*—
Curtiss, William P.; and Colley, William C., III, 4,356,440, Cl. 323-210.000.
Nevins, James L.; and Padavano, Joseph, 4,355,469, Cl. 33-185.00R.
Chatterjee, Pallab K.: *See*—
Fu, Horng-Sen; Tasch, Al F., Jr.; and Chatterjee, Pallab K., 4,356,040, Cl. 148-1.500.
Che, Stanley C., to Occidental Research Corporation. Pyrolysis process. 4,356,077, Cl. 208-8.00R.
Chemische Werke Huls Aktiengesellschaft: *See*—
Kelkenberg, Heike; and Wolf, Elmar, 4,356,307, Cl. 546-200.000.
Chen, Ho L. Punching machine for making different products at the same step. 4,355,530, Cl. 72-452.000.
Cherry Semiconductor Corporation: *See*—
Congdon, James S., 4,356,445, Cl. 324-82.000.
Cheung, Ki C.; Unkle, Truman F.; Schwartz. Arnold A.; and Hsieh, Raymond J., to General Atomic Company. Closure hold-down system for a reactor vessel. 4,356,144, Cl. 376-203.000.
Chever, Rene, to Fives-Cail Babcock. Bucket elevator. 4,355,714, Cl. 198-701.000.
Chiba, Takehisa: *See*—
Iwao, Junichi; Oya, Masayuki; Baba, Toshio; Iso, Tadashi; and Chiba, Takehisa, 4,356,183, Cl. 424-263.000.
Chicklis, Evan P., to Sanders Associates, Inc. Eye-safe laser cloud height rangefinder. 4,355,893, Cl. 356-4.000.
Chiu, Herman S.; and Watts, Keith A., to Union Carbide Corporation. Liquid coating method and apparatus. 4,356,218, Cl. 427-355.000.
Chloride Electro Networks, Division of Chloride, Inc., N. American Operation: *See*—
Carey, James J., 4,356,344, Cl. 174-52.00S.
Chloride Silent Power Limited: *See*—
Wright, Michael L.; and Hames, Michael D., 4,356,241, Cl. 429-104.000.
Cho, Ching-Fai: *See*—
Wolfson, Ronald I.; and Cho, Ching-Fai, 4,356,496, Cl. 343-854.000.
Cholod, Michael S.; and Shah, Nipun M., to Rohm and Haas Company. Catalyst system for a polyethylene terephthalate polycondensation. 4,356,299, Cl. 528-279.000.
Chombard, Pierre A.; and Darni, Daniel, to Societe Francaise d'Equipements pour la Navigation Arrienne. Centrifugal brake for a gyroscope with Cardan suspension. 4,355,540, Cl. 74-5.100.
Chore-Time Equipment, Inc.: *See*—
Peppler, William, 4,355,596, Cl. 119-18.000.
Chorlton, Derek C., to Conveyor Manufacturing Company, Ltd. Roller conveyor permitting low pressure accumulation of articles. 4,355,715, Cl. 198-781.000.
Chorvat, Robert J.; Desai, Bipinchandra N.; and Radak, Suzanne E., to G. D. Searle & Co. 4H-1,4-Benzothiazine derivatives. 4,356,302, Cl. 544-34.000.
Christensen, Burton G.; Ratcliffe, Ronald W.; and Salzmann, Thomas N., to Merck & Co., Inc. 3-(1-Hydroxyethyl)-4-(but-2-ene)-azetidin-2-one and derivatives. 4,356,120, Cl. 260-239.00A.
Christensen, Gordon D.: *See*—
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Christenson, Thomas: *See*—
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Chromalloy American Corporation: *See*—
Hall, Edward N., 4,355,538, Cl. 73-811.000.
Chu, Chung S. Modern fan device. 4,356,535, Cl. 362-35.000.
Chueh, Richard J., to Control Data Corporation. System page table apparatus. 4,356,549, Cl. 364-200.000.
Chupka, David E.: *See*—
Hatton, Derald R.; and Chupka, David E., 4,356,084, Cl. 209-211.000.
Church, Fredrick Z.; and Swesey, Calvin M. Portable turning tool. 4,355,553, Cl. 82-4.00R.
Ciallella, John G.: *See*—
Gordon, Richard; and Ciallella, John G., 4,356,047, Cl. 156-89.000.
Ciba-Geigy Corporation: *See*—
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Gschwend, Heinz W., 4,356,176, Cl. 424-244.000.
Trachsler, Dieter; and Lohse, Friedrich, 4,356,121, Cl. 260-239.30R.
Ciccone, Joseph L.: *See*—
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Citizen Watch Company, Limited: *See*—
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Ciuti, Brunello: *See*—
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Claas Ohg: *See*—
Heidjann, Franz; and Fromme, Werner, 4,355,647, Cl. 130-24.000.
Clark Equipment Company: *See*—
Barnes, Charles A.; Davis, Dean E.; and Wykoff, Carl L., 4,355,698, Cl. 180-273.000.
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Claypool, James L.: *See*—
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Clements, Ronald J.: *See*—
Hockin, Harry W., deceased; Bracanin, Brian F.; Clements, Ronald J.; Keran, Vitie P.; and Baker, Alan C., 4,356,031, Cl. 75-36.000.
Clifford, Jack R., to Pratt, Paul L.; and Pierce, John T., Jr., a part interest to each. Method for cleaning drains and waterways. 4,356,039, Cl. 134-8.000.
Cloos, Erwin; Schmidt, Manfred; Kring, Helmut; Schnell, Gerhard; and Thielmann, Joachim, to Carl Cloos Schweisstechnik GmbH. Apparatus for automatically guiding a welding gun along a programmed welding seam. 4,356,378, Cl. 219-124.100.
CNI Incorporated: *See*—
Rau, David M., III, 4,355,830, Cl. 292-144.000.
Coal Industry (Patents) Limited: *See*—
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Cobb, Delwin E.: *See*—
Rodibaugh, Scott A.; and Cobb, Delwin E., 4,355,964, Cl. 418-76.000.
Cobean, Richard W.; Wicnienski, Michael F.; and Feldman, Gary, to Baxter Travenol Laboratories, Inc. Apparatus for applying radiant beam. 4,356,394, Cl. 250-222.00R.
Coca-Cola Company, The: *See*—
Credle, William S., Jr., 4,355,653, Cl. 137-102.000.
Coffee, Ronald A., to Imperial Chemical Industries PLC. Atomization of liquids. 4,356,528, Cl. 361-226.000.
Coffey, Clayton G.; Murray, Stephen B.; and Bayly, Donald L., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. System for infrared emission suppression (sires). 4,355,507, Cl. 60-39.500.
Cogdell, Lawrence A., Jr. Portable answering device. 4,356,519, Cl. 360-61.000.
Cohen, Abraham B.; and Fan, Roxy, to Du Pont de Nemours, E. I., and Company. Multilayer photosensitive element with solvent-soluble layer. 4,356,251, Cl. 430-253.000.
Cohen, Albert; Brown, Ralph D.; and Scott, William D., to Westinghouse Electric Corp. Moisture removal structure for crossover conduits. 4,355,515, Cl. 60-657.000.
Coin-Operated Exercise Equipment Co. Inc.: *See*—
Rama, Lord, 4,355,803, Cl. 273-73.00J.
Cole, David L.; Swistak, Gregory B.; Ryon, Randall C.; Lama, William L.; and Northrup, Karl A., to Xerox Corporation. Reduction of lamp strobing effects in a reproducing apparatus. 4,355,891, Cl. 355-57.000.
Cole, Herbert S., Jr.: *See*—
Aftergut, Sigfried; and Cole, Herbert S., Jr., 4,356,102, Cl. 252-299.100.
Coleman, James P.; Hallcher, Richard C.; and McMackins, Dudley E., to Monsanto Company. Acyloxyalkenoic acids and process therefor. 4,356,317, Cl. 560-241.000.
Coleman, John D., to Commonwealth Scientific and Industrial Research Organization. Apparatus for establishing a liquid curtain. 4,355,762, Cl. 239-193.000.
Colgate-Palmolive Company: *See*—
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Colley, William C., III: *See*—
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Colwell, Joey G., Jr.: *See*—
Abercrombie, William F., Jr.; Colwell, Joey G., Jr.; and Price, Charles R., 4,356,093, Cl. 210-695.000.
Combustion Engineering, Inc.: *See*—
vander Have, Leonard A., 4,355,537, Cl. 73-708.000.
Comfort, Joseph A.; Perry, Thomas J.; and Loos, Michel, to GTE Automatic Electric Labs Inc. Circuit for equipping a variable number of bus units on a closed loop bus. 4,356,404, Cl. 307-115.000.
Commissariat a l'Energie Atomique: *See*—
Auriol, Alain; and Tritten, Paul, 4,356,215, Cl. 427-244.000.
Bathellier, Andre; and Ginisty, Claude, 4,356,153, Cl. 423-10.000.
Francois, Bernard; and Viguie, Jean-Claude, 4,356,135, Cl. 264-61.000.
Herbreteau, Louis, 4,356,487, Cl. 343-5.00W.
Commonwealth Scientific and Industrial Research Organization: *See*—
Coleman, John D., 4,355,762, Cl. 239-193.000.
Communications Satellite Corporation: *See*—
Uzunoglu, Vasil, 4,356,456, Cl. 331-117.00R.
Compagnie Generale des Etablissements Michelin: *See*—
Freixinos, Raymond, 4,355,675, Cl. 157-1.170.
Compagnie Internationale pour l'Informatique Cii-Honeywell Bull (Societe Anonyme): *See*—
Bavoux, Robert J. A.; Lemaire, Francis R. J.; and Salkazanov, Pierre, 4,356,548, Cl. 364-200.000.

Congdon, James S., to Cherry Semiconductor Corporation. Method and apparatus for driving air core meter movements. 4,356,445, Cl. 324-82.000.

Connors, Stephen T.: *See*—
Harvey, Kenneth; Connors, Stephen T.; and Baines, Eric, 4,356,168, Cl. 424-52.000.

Conoco Inc.: *See*—
Fenton, Jeff T., 4,356,071, Cl. 204-159.210.
Hattiangadi, Uday S., 4,355,601, Cl. 122-4.00D.
McClaflin, Gifford G., 4,355,651, Cl. 137-13.000.

Conrad, Lee R.; and Dowling, Edward C., Sr., to AMP Incorporated. Laminated optical fiber cable. 4,355,865, Cl. 350-96.230.

Consolidated Refining Co., Inc.: *See*—
Gordon, Richard; and Ciallella, John G., 4,356,047, Cl. 156-89.000.

Continental Group, Inc., The: *See*—
Hellmer, Ernest W., 4,355,967, Cl. 425-503.000.
Miller, Donald E., 4,355,527, Cl. 72-351.000.

Control Data Canada, Ltd.: *See*—
Wright, Keith G., 4,356,562, Cl. 370-20.000.

Control Data Corporation: *See*—
Chueh, Richard J., 4,356,549, Cl. 364-200.000.

Contronic Controls Limited: *See*—
Humphries, Peter; and Aeberli, Paul, 4,356,474, Cl. 340-509.000.

Conveyor Manufacturing Company, Ltd.: *See*—
Chorlton, Derek C., 4,355,715, Cl. 198-781.000.

Cook, Paul M.; Otte, Richard F.; Claypool, James L.; White, Lawrence J.; Broyles, Harry C.; and Brooks, Peter L., to Raychem Corporation. Apparatus for internal pipe protection. 4,355,664, Cl. 138-110.000.

Cooke, George, to Cedar Dunes Investments Ltd. Boiler. 4,355,602, Cl. 122-235.00R.

Cooper Industries, Inc.: *See*—
Bell, Leo A.; and Terbrack, William H., 4,356,557, Cl. 364-562.000.

Cope, Leonard D., to Sanders Associates, Inc. Video game symbol generation and control apparatus. 4,355,814, Cl. 273-85.00G.

Cope, Leonard D.: *See*—
Baer, Ralph H.; and Cope, Leonard D., 4,355,805, Cl. 273-85.00G.

Copyer Co., Ltd.: *See*—
Ishikawa, Shozo; Katagiri, Kazuharu; Watanabe, Katsunori; Ohta, Shigeto; and Kitahara, Makoto, 4,356,243, Cl. 430-58.000.

Corak Limited: *See*—
Rognoni, Antonio, 4,355,925, Cl. 405-172.000.
Rognoni, Antonio, 4,355,926, Cl. 405-172.000.

Corbett, Martin E. Headset/groundcord tester apparatus. 4,356,356, Cl. 179-175.10R.

Cornacchia, Felice: *See*—
Ghidella, Vittorio; and Cornacchia, Felice, 4,355,841, Cl. 296-185.000.

Cornell, S. Douglas, III. Superior performance passive solar water heater. 4,355,629, Cl. 126-437.000.

Cornette, Andre; and Rey, Georges, to Thomson-CSF. Process for insulating the interconnections of integrated circuits. 4,356,056, Cl. 156-649.000.

Cornick, Roy C. Rotary impeller for fluid driven machine. 4,355,958, Cl. 416-197.00A.

Coronet Werke Heinrich Schlerf GmbH: *See*—
Schnekenburger, Emil; and Schnekenburger, Rudolf, 4,355,847, Cl. 300-11.000.

Corry, David B., to Otto-Simon Carves Limited. Pre-heated coal supply system for a coking oven battery. 4,356,063, Cl. 201-41.000.

Costigan, Conrad A., to Spreading Machine Exchange, Inc. Spreading machine cutter box assembly. 4,355,794, Cl. 270-31.000.

Cowan, Jack C.; Thrash, Tommy; and Rayborn, Jerry R., to Venture Chemicals, Inc. Method of enhancing the effect of liquid organic lubricants in drilling fluids. 4,356,096, Cl. 252-8.50C.

Cowen, Geoffrey; Norton-Berry, Philip; and Steel, Margaret L., to Imperial Chemical Industries Limited. Chemical process in a medium connected to a rotating body. 4,356,133, Cl. 264-8.000.

CPC International Inc.: *See*—
Heady, Robert E., 4,356,262, Cl. 435-97.000.

Cragoe, Edward J., Jr.; Stokker, Gerald E.; and Gould, Norman P., to Merck & Co., Inc. [(5,6,9a-substituted-3-oxo-1,2,9,9a-tetrahydro-3H-fluoren-7-yl)oxy]alkanoic and cycloalkanoic acid esters and their analogs, the parent acids and their salts. 4,356,313, Cl. 560-53.000.

Cragoe, Edward J., Jr.; Stokker, Gerald E.; and Gould, Norman P., to Merck & Co., Inc. [5,6,9A-Substituted-3-oxo-1,2,9,9a-tetrahydro-3H-fluoren-7-yl)oxy]alkanoic and cycloalkanoic acids, their analogs, esters, salts, and derivatives. 4,356,314, Cl. 560-53.000.

Cram, Leonard A.; Jackson, Brian; and Gilday, Montague R., to Electric & Musical Industries Limited. Device for indicating the proximity of a target. 4,356,488, Cl. 343-7.0PF.

Crawford Industries, Inc.: *See*—
Crawford, Kenneth Z., 4,355,821, Cl. 281-33.000.

Crawford, Kenneth Z., to Crawford Industries, Inc. Display binder. 4,355,821, Cl. 281-33.000.

Credle, William S., Jr., to Coca-Cola Company, The. Vented check valve. 4,355,653, Cl. 137-102.000.

Crivello, James V.; and Ashby, Bruce A., to General Electric Company. Method of adhesive bonding using visible light cured epoxies. 4,356,050, Cl. 156-273.300.

Crosby, Samuel C., Jr.: *See*—
Whorton, Robert B., III; and Crosby, Samuel C., Jr., 4,355,735, Cl. 222-80.000.

Cross, L. Allan, to McMahon, Richard M. Squareangle. 4,355,471, Cl. 33-422.000.

Crown Zellerbach Corporation: *See*—
Hostetler, Ronald E., 4,356,059, Cl. 162-111.000.
Ohrberg, George E.; and O'Dair, James R., 4,355,670, Cl. 144-34.00R.

CSELT - Centro Studi e Laboratori Telecomunicazioni S.P.A.: *See*—
Viale, Ernesto, 4,356,563, Cl. 370-58.000.

CSELT—Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See*—
Barcaroli, Valerio; DeMichelis, Carlo; Giandonato, Giuseppe; and Giorcelli, Silvano, 4,356,547, Cl. 364-200.000.

Cunningham, Rosa. Stripping composition and method for preparing and using same. 4,356,069, Cl. 204-146.000.

Cunningham, Vernon R., to Rockwell International Corporation. Split phase delay equalizer with reduced insertion loss. 4,356,460, Cl. 333-28.00R.

Curtiss, William P.; and Colley, William C., III, to Charles Stark Draper Laboratory, Inc., The. Power factor correction system. 4,356,440, Cl. 323-210.000.

Curzio, Frederick H., to Textile Products, Incorporated. Graphite fiber alignment process and apparatus and fabric produced therefrom. 4,355,668, Cl. 139-420.00R.

Cuscurida, Michael; and Speranza, George P., to Texaco Inc. Method of decolorizing mixtures of T-butyl alkylphenols with N-(2-hydroxyethyl)oxazolidine. 4,356,330, Cl. 568-756.000.

Cutter Laboratories, Inc.: *See*—
Morin, Marius J., 4,355,783, Cl. 251-9.000.

Dahlberg, Bengt A. G.; Holmberg, Bengt M.; and Nilsson, Lennart O. E., to Gambro AB. Thermostatically controlled electric fluid heating apparatus. 4,356,383, Cl. 219-308.000.

Dahle, Leonard G.: *See*—
Ringrose, James R.; and Dahle, Leonard G., 4,355,956, Cl. 416-132.00B.

Dahm, Manfred: *See*—
Wagner, Kuno; Dahm, Manfred; and Muller, Hanns P., 4,356,275, Cl. 521-136.000.

Dail, Robert P.: *See*—
Bond, James M.; and Dail, Robert P., 4,355,574, Cl. 100-234.000.

Daimer, Wolfgang; and Verdino, Heiner, to Vianova Kunstharz, A.G. Heat-hardenable resins suitable for cathodic deposition. 4,356,278, Cl. 523-414.000.

Daimler-Benz Aktiengesellschaft: *See*—
Grohn, Michael, 4,355,503, Cl. 60-602.000.

Dainippon Pharmaceutical Co., Ltd.: *See*—
Uno, Hitoshi; Kurokawa, Mikio; and Nakamura, Hideo, 4,356,186, Cl. 424-275.000.

Dakin, John P., to Plessey Overseas Limited. Optical detecting, monitoring or measuring arrangements. 4,355,898, Cl. 356-346.000.

D'Amico, Thomas V.: *See*—
Quirey, Tim A.; and D'Amico, Thomas V., 4,356,389, Cl. 235-455.000.

Dancsi, Lajos: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Dancsi, Lajos; Keve, Tibor; and Drexler, Ferenc, 4,356,305, Cl. 546-51.000.

Darling, Thomas R., to Du Pont de Nemours, E. I., and Company. Purification and polymerization of hexafluoropropylene oxide. 4,356,291, Cl. 525-403.000.

Darlington, William B., to FPG Industries, Inc. Permionic membrane. 4,356,068, Cl. 204-98.000.

Darni, Daniel: *See*—
Chombard, Pierre A.; and Darni, Daniel, 4,355,540, Cl. 74-5.100.

Dastoli, Barbara; Garner, Brigitte; and Gorski, Ellen. Nursing bra. 4,355,641, Cl. 128-460.000.

Data General Corporation: *See*—
West, Kenneth J., 4,356,545, Cl. 364-200.000.

Data General, Inc.: *See*—
Marino, Jerry C.; and Bibeau, Lawrence J., 4,356,531, Cl. 361-384.000.

Davey, Thomas R. A. Process for refining metals by drossing procedures. 4,356,033, Cl. 75-63.000.

David, John L.: *See*—
Bray, David W.; David, John L.; and Ferris, Erman E., 4,356,490, Cl. 343-17.20R.

Davidow, William H.: *See*—
Katzman, James A.; Bartlett, Joel F.; Bixler, Richard M.; Davidow, William H.; Despotakis, John A.; Graziano, Peter J.; Green, Michael D.; Greig, David A.; Hayashi, Steven J.; Mackie, David R.; McEvoy, Dennis L.; Treybig, James G.; and Wierenga, Steven W., 4,356,550, Cl. 364-200.000.

Davidson, James G., to Davidson Research Ltd. Process for the production of hydrogen. 4,356,163, Cl. 423-657.000.

Davidson Research Ltd.: *See*—
Davidson, James G., 4,356,163, Cl. 423-657.000.

Davies, James F.; and Tune, John B., to Lever Brothers Company. Fabric treatment products. 4,356,099, Cl. 252-90.000.

Davis, Dean E.: *See*—
Barnes, Charles A.; Davis, Dean E.; and Wykoff, Carl L., 4,355,698, Cl. 180-273.000.

Davis, Gerald T.: *See*—
Schwab, Gerhart; and Davis, Gerald T., 4,356,108, Cl. 252-316.000.

Davison, Michael J.: *See*—
Seilly, Alec H.; Mowbray, Dorian F.; Mardell, John E.; and Davison, Michael J., 4,355,620, Cl. 123-499.000.

Day, Charles E.; and Putman, William A., to Allis-Chalmers Corporation. Pocket filter assembly. 4,356,011, Cl. 55-368.000.

Day, George W., to Vacuumatic Limited. Apparatus for separating sheets from a stack. 4,355,796, Cl. 271-20.000.

Dayco Corporation: *See*—
Brew, James K., 4,355,994, Cl. 474-270.000.

Dean, Arthur R., to United States of America, Navy. Snubber assembly. 4,355,791, Cl. 267-136.000.

Deason, James R.; and Partis, Richard A., to G. D. Searle & Co. Antiallergic or antihypertensive 1-piperidinylmethyl benzenamines. 4,356,184, Cl. 424-267.000.

Deere & Company: *See*—
Hamm, Nicholas; and Rosbak, John, 4,355,688, Cl. 172-4.000.
Jensen, Thomas C.; Stevens, Phillip E.; and Landry, Henry J., Jr., 4,355,690, Cl. 172-311.000.
Orlandea, Nicolae V.; and Wiley, Jack C., 4,355,697, Cl. 180-261.000.
Wykhuis, Lloyd A.; and O'Neill, Michael J., 4,355,946, Cl. 414-707.000.

Defibrator Aktiebolag: *See*—
Johansson, Inge J. G.; and Reinhall, Rolf B., 4,355,767, Cl. 241-244.000.
Johansson, Johan G. I., 4,355,768, Cl. 241-261.300.

DeGeeter, Melvin J., to Upjohn Company, The. Animal feed and process. 4,356,191, Cl. 424-321.000.

DeGeeter, Melvin J., to Upjohn Company, The. Animal feed and process. 4,356,192, Cl. 424-326.000.

DeGeeter, Melvin J., to Upjohn Company, The. Animal feed and process. 4,356,193, Cl. 424-326.000.

DeGeeter, Melvin J., to Upjohn Company, The. Animal feed and process. 4,356,194, Cl. 424-326.000.

de Graaf, Stephanus A. G.: *See*—
Brink, Ted; and de Graaf, Stephanus A. G., 4,356,281, Cl. 524-397.000.

Deloison, Victor; and Pottier, Gilbert, to S.A. Benoist Girard & Cie. Surgical prosthesis with grainy surface. 4,355,428, Cl. 3-1.910.

Demarne, Henri; Bernhart, Claude; and Lansen, Jacqueline, to C.M. Industries. Myocardium-protecting pyridine derivatives having an anti-arrhythmic activity and an activity as blood-platelets antiaggregants. 4,356,177, Cl. 424-248.540.

DeMichelis, Carlo: *See*—
Barcaroli, Valerio; DeMichelis, Carlo; Giandonato, Giuseppe; and Giorcelli, Silvano, 4,356,547, Cl. 364-200.000.

de Munck, Nicolaas A.; and Scholten, Joseph J. F., to Stamicarbon, B.V. Preparation of 2-hydroxytetrahydrofuran. 4,356,125, Cl. 549-475.000.

Demus, Dietrich: *See*—
Schubert, Herrmann; Pelzl, Gerhard; Zaschke, Horst; Demus, Dietrich; Nothni, Hans-Ulrich; and Kuschel, Frank, 4,356,103, Cl. 252-299.100.

Denham, Keith; Prickett, Leslie R.; and Pallister, Lawrence R., to Aerpat A.G. Self-plugging blind rivet. 4,355,934, Cl. 411-38.000.

Denti, Ennio: *See*—
Callegaro, Lanfranco; Boniolo, Antonio; Denti, Ennio; Rosa, Umberto; and Rossi, Valdano, 4,356,267, Cl. 435-179.000.

Deragon, Allen E. Portable tent for motorcyclists. 4,355,649, Cl. 135-1.00A.

Derickson, Edward E. Automatic loading platform and method of using same. 4,355,940, Cl. 414-439.000.

Desaau, Ralph M., to Mobil Oil Corporation. Denitrification of hydrocarbon feedstock. 4,356,079, Cl. 208-10.000.

Desai, Bipinchandra N.: *See*—
Chorvat, Robert J.; Desai, Bipinchandra N.; and Radak, Suzanne E., 4,356,302, Cl. 544-34.000.

Desai, Mahendra N.: *See*—
Kutnyak, Thomas A.; Desai, Mahendra N.; and Berman, Roy A., 4,356,284, Cl. 524-520.000.

Descours-Saint-Martino, Marie-Ange: *See*—
Pacheco, Henri; Descours-Saint-Martino, Marie-Ange; Yavordios, Demetre; and Koeberle, Jean, 4,356,188, Cl. 424-317.000.

Design Professionals Financial Corp.: *See*—
Okubo, Shigeo, 4,355,541, Cl. 74-5.60E.

Design Research Marketing (Proprietary) Limited: *See*—
Van Vliet, Marius, 4,355,918, Cl. 403-170.000.

Despotakis, John A.: *See*—
Katzman, James A.; Bartlett, Joel F.; Bixler, Richard M.; Davidow, William H.; Despotakis, John A.; Graziano, Peter J.; Green, Michael D.; Greig, David A.; Hayashi, Steven J.; Mackie, David R.; McEvoy, Dennis L.; Treybig, James G.; and Wierenga, Steven W., 4,356,552, Cl. 364-200.000.

Deubzer, Bernward; Egerter, Norbert; Frey, Volker; and Leitner, Kurt, to Wacker-Chemie GmbH. Organosiloxane block copolymers. 4,356,293, Cl. 525-477.000.

Devitt, Michael T.; and Rossell, John B., to Lever Brothers Company. Edible oil. 4,356,197, Cl. 426-89.000.

De Witt, Walter G., III: *See*—
Brodnyan, John G.; De Witt, Walter G., III; Gill, Robert A.; and Stelling, Gary D., 4,356,229, Cl. 428-288.000.

Dey, Arabinda N.; and Hamilton, Noble E., to Duracell Inc. Extremely high rate flat cell. 4,356,240, Cl. 429-101.000.

Diamond International Corporation: *See*—
Thomas, Leslie P.; and Bliss, George N., 4,355,936, Cl. 414-118.000.

Diamond, Michael N.: *See*—
Susnjara, Kenneth J.; and Diamond, Michael N., 4,356,554, Cl. 364-513.000.

Diamond, Steven E.; Mares, Frank; Muccigrosso, Deborah A.; and Solar, Jeffrey P., to Allied Corporation. Producing epoxide from olefin using metal nitro complexes. 4,356,311, Cl. 549-524.000.

Diaralux: *See*—
Faubert, Guy, 4,355,879, Cl. 354-329.000.

Diaz-Infante, Javier: *See*—
Armstrong, Errol C.; Diaz-Infante, Javier; and Hall, David J., 4,355,588, Cl. 111-3.000.

Diaz, Zaida: *See*—
Blytas, George C.; and Diaz, Zaida, 4,356,155, Cl. 423-226.000.

Di Carlo, Edward F., to General Dynamics, Pomona Division. Optic floating deck modulator. 4,356,457, Cl. 332-3.000.

Dickore, Karlfried; and Kuhle, Engelbert, to Bayer Aktiengesellschaft. Process for the preparation of 1-amino-1,3,5-triazine-2,4(1H, 3H)-dione compounds. 4,356,024, Cl. 71-93.000.

Diebold Incorporated: *See*—
Graef, Harry T.; Mercer, Scott A.; Hill, Jeffrey A.; and Newton, Kevin H., 4,355,797, Cl. 271-20.000.

Diefendahl, Wolfgang; and Koch, Karl-Friedrich, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Bridge element. 4,355,431, Cl. 14-27.000.

Dietrich, Martin. Apparatus for cleaning root crops in the field. 4,355,433, Cl. 15-302.000.

Dietz, Hermann, to Robert Bosch GmbH. Polarographic oxygen concentration sensor and method of determining oxygen content in the exhaust gases of an internal combustion engine. 4,356,065, Cl. 204-1.00T.

Dietz, Hermann: *See*—
Muller, Klaus; Rieger, Franz; Maurer, Helmut; Linder, Ernst; Reber, Harald; and Dietz, Hermann, 4,355,618, Cl. 123-489.000.

Digital Products Corporation: *See*—
Smith, Fred J., 4,356,348, Cl. 179-1.0MN.

DiLeone, Roland R.: *See*—
Szita, Jeno G.; and DiLeone, Roland R., 4,356,304, Cl. 544-196.000.

Dilling, Peter; and Prazak, Gerald, to Westvaco Corporation. Azo dye reduction improvement of lignin. 4,355,996, Cl. 8-561.000.

DiMatteo, Paul; Segnini, Robert; and Rademacher, Paul, to Solid Photography, Inc. Gauging system for sculptured surfaces. 4,355,447, Cl. 29-26.00A.

Direct Reduction Corporation, The: *See*—
Hockin, Harry W., deceased; Bracanin, Brian F.; Clements, Ronald J.; Keran, Vitie P.; and Baker, Alan C., 4,356,031, Cl. 75-36.000.

Director-General of Agency of Industrial Science and Technology: *See*—
Matsushita, Shizuo; and Togawa, Yasuhito, 4,356,076, Cl. 204-261.000.

Director of National Food Research Institute, Ministry of Agriculture, Forestry and Fisheries: *See*—
Kobayashi, Toshio, 4,355,520, Cl. 62-123.000.

Di Salvo, Francesco, to Sis-Ter S.p.A. Apparatus for the parenteral administration of liquids at a constant, adjustable flow rate. 4,355,639, Cl. 128-214.00R.

Di Santo, Vincent: *See*—
Massey, Raymond D.; and Di Santo, Vincent, 4,355,452, Cl. 29-437.000.

Diversitronics, Inc.: *See*—
Nevyas, Herbert J.; and Traub, Alan C., 4,355,871, Cl. 351-13.000.

Divisek, Jiri; Schmitz, Heinrich; and Hesse, Renke, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Porous oxide diaphragm for alkaline electrolyses, and manufacture thereof. 4,356,231, Cl. 428-304.400.

Dr. Ing. h.c.F. Porsche A.G.: *See*—
Dorsch, Heinz, 4,355,617, Cl. 123-453.000.
Ziegler, Hermann; and Kolb, Eugen, 4,355,845, Cl. 296-210.000.

Dogen, Masako: *See*—
Nakao, Makoto; Nakao, Toshiko; Nagai, Fumiko; Dogen, Masako; and Tabata, Yoshitomi, 4,356,172, Cl. 424-101.000.

Doi, Toshitada; Furukawa, Shunsuke; and Nanba, Kenji, to Sony Corporation. Digital signal transmission system with encoding and decoding sections for correcting errors by parity signals transmitted with digital information signals. 4,356,564, Cl. 371-40.000.

Dolan, Daniel F.: *See*—
Liu, Benjamin Y. H.; Kittelson, David B.; Dolan, Daniel F.; and Pui, David Y. H., 4,355,504, Cl. 60-275.000.

Dolzhenkov, Boris S.; Andreev, Vladimir F.; and Pimenov, Vitalii A. Gas pump for stirring molten metal. 4,355,789, Cl. 266-207.000.

Donaher, Charles J.; and Christensen, Gordon D., to Thomas & Betts Corporation. Electronic package and accessory component assembly. 4,356,532, Cl. 361-393.000.

Doniat, Denis. Electrode construction for liquid electrolyte electrochemical generators. 4,356,242, Cl. 429-234.000.

Doori, Hisashi, to Yoshida Kogyo K.K. Apparatus for holding sliders on an angularly movable indexing means. 4,355,461, Cl. 29-768.000.

Doring, John D.: *See*—
Kallok, Michael J.; and Doring, John D., 4,355,646, Cl. 128-786.000.

Dorsch, Heinz, to Dr. Ing. h.c.F. Porsche A.G. Fuel injection system for internal combustion engines with continuous injection in the intake pipe. 4,355,617, Cl. 123-453.000.

Dougherty, Daniel J.: *See*—
Barlett, Salvadore P.; Dougherty, Daniel J.; and Lokuta, Frederick P., 4,355,457, Cl. 29-583.000.

Douglas, Robert J.: *See*—
Komanduri, Ranga; Lee, Minyoung; Flom, Donald G.; Thompson, Robert A.; Jones, Marshall G.; and Douglas, Robert J., 4,356,376, Cl. 219-121.0LN.

Dow Chemical Company, The: *See*—
Caines, Ronald S., 4,355,684, Cl. 165-154.000.
Lalk, James W.; and Hamburg, Frances P., 4,356,309, Cl. 546-278.000.

St. Louis, Harold E.; and Trumbull, Walter A., 4,355,905, Cl. 366-79.000.
Shipley, Randall S.; and Lowery, Kirby, Jr., 4,356,111, Cl. 252-429.00B.

Dowling, Edward C., Sr.: *See—*
Conrad, Lee R.; and Dowling, Edward C., Sr., 4,355,865, Cl. 350-96.230.

Down, Michael G.; Heberlein, Joachim V. R.; and Meyer, Thomas N., to Westinghouse Electric Corp. Titanium product collection in a plasma reactor. 4,356,029, Cl. 75-0.50B.

Downey, Rogers B., to Polaroid Corporation. Process machine having a single cam actuator per category of processing function. 4,355,462, Cl. 29-791.000.

Doyle, Timothy E. Equatorial sundial. 4,355,470, Cl. 33-270.000.

Dozier, Hilliard. Electrical terminal with thermal interrupter. 4,356,469, Cl. 337-401.000.

Dragerwerk AG: *See—*
Oetjen, Georg-Wilhelm; and Benthin, Frank, 4,355,636, Cl. 128-204.130.

Drent, Eit, to Shell Oil Company. Carbonylation of alkanols and/or aliphatic ethers. 4,356,126, Cl. 260-410.90R.

Dresser Industries, Inc.: *See—*
Blackwell, Henry W., 4,355,443, Cl. 24-263.00D.

Dressler, Daryl D., to Minnesota Mining and Manufacturing Company. Liquid level sensing circuitry. 4,356,480, Cl. 340-620.000.

Drexler, Ferenc: *See—*
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Dancsi, Lajos; Keve, Tibor; and Drexler, Ferenc, 4,356,305, Cl. 546-51.000.

Duck, Gerhard, to Goetze AG. Piston ring. 4,355,815, Cl. 277-143.000.

Duckworth, Joseph M.: *See—*
Nijhawan, Pramodh; and Duckworth, Joseph M., 4,356,064, Cl. 202-263.000.

Dudgeon, Charles D.: *See—*
Lee, Yue G. L.; and Dudgeon, Charles D., 4,356,297, Cl. 528-44.000.

Dudley, Robert A. Portable bootjack. 4,355,744, Cl. 223-114.000.

Dudome, Michel, to Thomson-CSF. Non-dispersive array antenna and electronically scanning antenna comprising same. 4,356,497, Cl. 343-854.000.

Duffy, Michael T.: *See—*
Berkman, Samuel; Duffy, Michael T.; and Temple, Harold E., 4,356,152, Cl. 422-248.000.

Dufour, Marcel, to Ascoe Felts, Inc. Papermarkers interwoven wet press felt. 4,356,225, Cl. 428-234.000.

Dufrasne, Jean-Claude; and Thibaut, Jules, to Ateliers de Constructions Electriques de Charleroi. Electrical apparatus comprising a series of current taps and variable switching gear. 4,356,359, Cl. 200-11.0TC.

Dunbar, Glenn G. Lifting apparatus. 4,355,833, Cl. 294-87.00R.

Duncan, Jock S., Jr., to Gates Rubber Company, The. Torsionally elastic power transmitting device. 4,355,990, Cl. 474-94.000.

Dunn, Michael P.: *See—*
Reeves, James E., Jr.; Dunn, Michael P.; and Patterson, John L., 4,355,438, Cl. 19-0.510.

Dunnigan, Jacques: *See—*
Lalancette, Jean M.; and Dunnigan, Jacques, 4,356,057, Cl. 162-3.000.

Du Pont de Nemours, E. I., and Company: *See—*
Buzzell, John G., 4,356,253, Cl. 430-291.000.
Cohen, Abraham B.; and Fan, Roxy, 4,356,251, Cl. 430-253.000.
Darling, Thomas R., 4,356,291, Cl. 525-403.000.
Lee, Ross A., 4,356,252, Cl. 430-270.000.
Romanauskas, William A., 4,356,083, Cl. 209-155.000.
Waller, Francis J., 4,356,318, Cl. 562-406.000.

Duracell Inc.: *See—*
Dey, Arabinda N.; and Hamilton, Noble E., 4,356,240, Cl. 429-101.000.

Dwight, Owen. Method of forming dental restorations. 4,355,980, Cl. 433-226.000.

Dyer, Alan, to Laporte Industries Limited. Surgical masks. 4,355,637, Cl. 128-206.190.

Dyer, Alan; and Araya, Abraham, to Laporte Industries Limited. Zeolites bearing fluoride anions. 4,356,156, Cl. 423-328.000.

Dynamit Nobel AG: *See—*
Lumbeck, Peter; and Exner, Hans, 4,356,162, Cl. 423-600.000.

Dyneer Corporation: *See—*
Kraft, Derald H., 4,355,991, Cl. 474-110.000.

E. R. Squibb & Sons, Inc.: *See—*
Krapcho, John, 4,356,182, Cl. 424-263.000.

Eagle-Picher Industries, Inc.: *See—*
Bailey, Charles L.; and Baker, Roy D., 4,355,626, Cl. 126-190.000.

Eastman Kodak Company: *See—*
Abel, Edward P.; and Weissberger, Edward, 4,356,249, Cl. 430-215.000.
Irani, Nayyir F.; and Maier, Thomas O., 4,356,250, Cl. 430-216.000.
Marcus, Michael A., 4,356,424, Cl. 310-357.000.
O'Brien, David F.; and Tyminski, Patricia N., 4,356,256, Cl. 430-332.000.
Tang, Ching W., 4,356,429, Cl. 313-503.000.

Eaton Corporation: *See—*
Light, Gerard M., 4,355,709, Cl. 192-58.00B.

Ebisui, Takashi: *See—*
Katagi, Takashi; Urasaki, Shuji; Ebisui, Takashi; and Aoki, Katsuhiko, 4,356,494, Cl. 343-781.0CA.

Eckhardt, Gert, to Licentia Patent Verwaltungs-G.m.b.H. Method for transmitting data in a time multiplex transmission. 4,356,484, Cl. 340-825.030.

Edison International, Inc.: *See—*
Siiberg, Hemming G., 4,356,365, Cl. 200-83.00J.

Edwards, Gerald T.; and Schluderberg, Donald C., to Babcock & Wilcox Company, The. Method of assembling and disassembling a control component structure. 4,355,449, Cl. 29-426.200.

Edwin Cooper, Inc.: *See—*
Papay, Andrew G., 4,356,097, Cl. 252-33.400.

Egerter, Norbert: *See—*
Deubzer, Bernward; Egerter, Norbert; Frey, Volker; and Leitner, Kurt, 4,356,293, Cl. 525-477.000.

Eggert, Walter S., Jr., to Budd Company, The. Side bearing for a railway car. 4,355,583, Cl. 105-199.0CB.

Eguchi, Yoichi; and Yokota, Takeshi, to Pioneer Electronic Corporation. Radio receiver with bandwidth switching. 4,356,567, Cl. 455-177.000.

Ehret, Thomas M., to FMC Corporation. Pipe swivel joint for ambient and cryogenic temperatures. 4,355,827, Cl. 285-98.000.

Eisenwerk-Gesellschaft Maximilianshutte: *See—*
Brotzmann, Karl; and Mantey, Paul, 4,356,035, Cl. 75-52.000.

Ejiri, Koichi; Kurose, Morisumi; and Hayakawa, Seiji, to Ricoh Co., Ltd. Method of restoring a picture cell by estimation with high density. 4,356,555, Cl. 364-515.000.

Electric & Musical Industries Limited: *See—*
Cram, Leonard A.; Jackson, Brian; and Gilday, Montague R., 4,356,488, Cl. 343-7.0PF.

Electric Power Research Institute, Inc.: *See—*
Putman, Thomas H.; Gyugyi, Laszlo; and Brennen, Michael B., 4,356,441, Cl. 323-210.000.

Electrochemical Products, Inc.: *See—*
McCoy, Ewald H., 4,356,067, Cl. 204-43.00Z.

Electronic Associates, Inc.: *See—*
Muldoon, James P., 4,355,533, Cl. 73-23.100.

Elevator GmbH: *See—*
Makinen, Heimo, 4,355,704, Cl. 187-29.00R.

Elford, William J.; Williams, Donald E.; and Miller, Keith H., to St. Regis Paper Company. Complete production line of wood I-joist manufacturing apparatus the method of manufacture, and the I-joist product, having lumber chords and a plywood web. 4,356,045, Cl. 156-64.000.

Eli Lilly and Company: *See—*
Garbrecht, William L., 4,356,207, Cl. 426-548.000.

Ellert, Roger H., to Scholle Corporation. Roller chute. 4,355,493, Cl. 53-113.000.

Ellis, Ted J., Jr.: *See—*
Hostetler, Thomas E.; and Ellis, Ted J., Jr., 4,356,369, Cl. 200-334.000.

Ellis, William: *See—*
Erdman, Frank H.; and Ellis, William, 4,355,724, Cl. 209-529.000.

Elwing, Hans B. Enzymatic indicator system. 4,356,260, Cl. 435-29.000.

Emanuel, Peter R.; Salman, Syed; and Mohiuddin, Gulam, to International Telephone and Telegraph Corporation. Molded plastic product having a plastic substrate containing a filler and an in-mold plastic coating firmly bonded thereon and a process for its manufacture. 4,356,230, Cl. 428-290.000.

Emerson Electric Co.: *See—*
Stahlhut, Leo G.; Garnett, Willard R.; and Kenyon, Lewis W., 4,356,537, Cl. 362-148.000.

Emery, Franklin T., to Westinghouse Electric Corp. Detection of arcing faults in polyphase electric machines. 4,356,443, Cl. 324-51.000.

Emery Industries, Inc.: *See—*
Schlossman, Irwin S., 4,356,315, Cl. 560-81.000.

Endo, Akira: *See—*
Hirota, Yukitsugu; Endo, Akira; and Sekine, Kenji, 4,356,489, Cl. 343-7.0VM.

Endo, Nobuhiro: *See—*
Iida, Yasuo; Suzuki, Katumi; and Endo, Nobuhiro, 4,356,223, Cl. 428-156.000.

Energy Conversion Devices, Inc.: *See—*
Klose, Peter H.; and Ovshinsky, Herbert C., 4,355,890, Cl. 355-54.000.

Eng, Kai Y.; and Yue, On-Ching, to Bell Telephone Laboratories, Incorporated. SAW-Implemented time compandor, 4,356,353, Cl. 179-15.55T.

Engedal, Knud: *See—*
Borrman, Bo; and Engedal, Knud, 4,356,147, Cl. 376-291.000.

Engelhardt, Werner: *See—*
Wulfing, Karl-Heinz; and Engelhardt, Werner, 4,355,749, Cl. 226-171.000.

Engkvist, Lars G., to Soneruds Maskin Aktiebolag. Bucket assembly. 4,355,476, Cl. 37-117.500.

English Electric Valve Company Limited: *See—*
Menown, Hugh, 4,356,426, Cl. 313-193.000.

Engstrom, Olof: *See—*
Brogardh, Torgny; and Engstrom, Olof, 4,356,448, Cl. 324-244.000.

Erdman, Frank H.; and Ellis, William, to Tropicana Products, Inc. Apparatus for sensing depressions in top panels of containers. 4,355,724, Cl. 209-529.000.

Ericson, Dan W. Patrix for the production of a gold core for a prepared root-filled tooth. 4,355,978, Cl. 433-220.000.

Erthein, Marc, to National Hanger Co., Inc. Heavy and light duty garment clamping hanger. 4,355,743, Cl. 223-96.000.

Essex Group, Inc.: *See—*
Brown, Samuel J.; and Lorenz, Jerome L., 4,356,466, Cl. 335-203.000.

Estebanell, Juan B. Cleaner-opener-comber device for textile fibers in combing machines. 4,355,439, Cl. 19-105.000.

Ethyl Corporation: *See*—
LoMaglio, Lewis C., 4,356,053, Cl. 156-499.000.

Europaisches Laboratorium Fur: *See*—
Simons, Kai; and Helenius, Ari, 4,356,169, Cl. 424-89.000.

Exner, Hans: *See*—
Lumbeck, Peter; and Exner, Hans, 4,356,162, Cl. 423-600.000.

Exxon Research and Engineering Co.: *See*—
Vinarub, Edmond I., 4,356,432, Cl. 315-287.000.

Ezaki, Sazo, to Toyoda Gosei Co., Ltd. Trim and producing method thereof. 4,355,448, Cl. 29-413.000.

F. Korbel and Bros.: *See*—
Williams, David W.; Jordan, James L.; and Huntsinger, James E., 4,356,208, Cl. 426-592.000.

F. L. Smidth & Co.: *See*—
Knudsen, Hans B., 4,355,909, Cl. 374-135.000.

Fahner, Theodorus A.: *See*—
Wittekoek, Stefan; and Fahner, Theodorus A., 4,356,392, Cl. 250-201.000.

Faller, Rudolph A., to Champion International Corporation. Food tray. 4,355,755, Cl. 229-2.50R.

Fan, Roxy: *See*—
Cohen, Abraham B.; and Fan, Roxy, 4,356,251, Cl. 430-253.000.

Fancher, Llewellyn W., to Stauffer Chemical Company. S-Alkyl and alkenyl-thiophenylacetamido thiophosphates and phosphonates as plant growth regulants. 4,356,022, Cl. 71-87.000.

Fansteel Inc.: *See*—
Bates, Victor T., 4,356,028, Cl. 75-0.5AB.

Fantini Muzzarelli, Marco, to Fiat Auto S.p.A. Skeletal load-bearing structures for motor vehicles. 4,355,844, Cl. 296-205.000.

Fattor, Arthur. Concentrating solar collector with tracking multipurpose targets. 4,355,630, Cl. 126-438.000.

Faubert, Guy, to Diaralux. Photographic developing tank. 4,355,879, Cl. 354-329.000.

Faust, Gottfried: *See*—
Lehmann, Dieter; Femmer, Klaus; and Faust, Gottfried, 4,356,322, Cl. 564-185.000.

Fayfield, Robert W., to Banner Engineering Corp. Alignment indicator for photoelectric scanners. 4,356,393, Cl. 250-214.00R.

Federal-Mogul Corporation: *See*—
Ladin, Eli M., 4,355,992, Cl. 474-152.000.

Feijen, Jan: *See*—
Peterson, Robert V.; Anderson, James M.; Gregonis, Donald E.; Kim, Sunj-Wan; and Feijen, Jan, 4,356,166, Cl. 424-19.000.

Feilchenfeld, Michal M., to Westinghouse Electric Corp. Optical path monitoring circuit for a document scanner. 4,356,390, Cl. 235-455.000.

Feinberg, Albert E., to Advance Transformer Company. Magnetron energizing circuit. 4,356,431, Cl. 315-101.000.

Feist, Wieland; and Kebschull, Franz. Arrangement for measuring the position of an index. 4,355,901, Cl. 356-373.000.

Feist, Wieland. Arrangement for determining the errors the vertical axis of a surveying device. 4,355,902, Cl. 356-375.000.

Feldman, Gary: *See*—
Cobean, Richard W.; Wicnienski, Michael F.; and Feldman, Gary, 4,356,394, Cl. 250-222.00R.

Felix, Raymond A., to Stauffer Chemical Company. Substituted cyclopropylmethoxy phenyl ureas and their use as herbicides. 4,356,026, Cl. 71-120.000.

Femmer, Klaus: *See*—
Lehmann, Dieter; Femmer, Klaus; and Faust, Gottfried, 4,356,322, Cl. 564-185.000.

Fenton, Jeff T., to Conoco Inc. Thermally stable polyoxymethylene containing polymers. 4,356,071, Cl. 204-159.210.

Ferrieu, Gilbert M. M., to Telecommunications Radioelectriques et Telephoniques T.R.T. Electronic subscriber junctor. 4,356,334, Cl. 179-16.0AA.

Ferrieu, Gilbert M. M.; Osmond, Etienne J. R.; and Hetet, Yves J. F., to Telecommunications Radioelectriques et Telephoniques T.R.T. Apparatus for detecting the closure of a subscriber's line during ringing. 4,356,355, Cl. 179-18.0HB.

Ferris, Erman E.: *See*—
Bray, David W.; David, John L.; and Ferris, Erman E., 4,356,490, Cl. 343-17.20R.

Ferrofluidics Corporation: *See*—
Chagnon, Mark S., 4,356,098, Cl. 252-62.510.

Fettweis, Alfred, to Siemens Aktiengesellschaft. Filter for electric signals consisting of switches, capacitors and amplifiers. 4,356,464, Cl. 333-173.000.

Fiat-Allis Construction Machinery, Inc.: *See*—
Lorenc, Donald D., 4,355,944, Cl. 414-685.000.

Fiat Auto S.p.A.: *See*—
Fantini Muzzarelli, Marco, 4,355,844, Cl. 296-205.000.
Ghidella, Vittorio; and Cornacchia, Felice, 4,355,841, Cl. 296-185.000.

Fickes, Scott A.; and Welch, William A. Flea collar kit. 4,355,599, Cl. 119-106.000.

Filtrol Corporation: *See*—
Lim, John; Brady, Michael; and Novak, Kirk, 4,356,113, Cl. 252-455.00Z.

Findlay, John W. A.; Butz, Robert F.; and Welch, Richard M., to Burroughs Wellcome Co. Bupropion radioimmunoassay, and kit. 4,356,165, Cl. 424-1.000.

Finike Italiana Marposs S.p.A.: *See*—
Albertazzi, Gastone, 4,355,467, Cl. 33-143.00L.

Finnegan, Stephen A.: *See*—
Sewell, Robert G. S.; Pringle, John K.; Backman, Marvin E.; and Finnegan, Stephen A., 4,355,562, Cl. 89-36.00A.

Firestone Tire & Rubber Company, The: *See*—
Bethea, Tristram W.; and Futamura, Shingo, 4,356,286, Cl. 525-183.000.

Fischer, Artur. Mounting element for securing an object to a support structure. 4,355,933, Cl. 411-19.000.

Fischer, Siegbert; and Pfalzer, Lothar, to J. M. Voith GmbH. Process for the reprocessing of papers. 4,356,058, Cl. 162-5.000.

Fisher, Robert J., to Harman International Industries, Inc. Selector and directional actuator for electrical remote control rearview mirrors. 4,356,357, Cl. 200-5.00R.

Fisons Limited: *See*—
Payling, David W.; and Suschitzky, John L., 4,356,181, Cl. 424-258.000.

FitzGerald, David: *See*—
Nelson, Kenneth L.; and FitzGerald, David, 4,355,969, Cl. 431-4.000.

Fives-Cail Babcock: *See*—
Chever, Rene, 4,355,714, Cl. 198-701.000.

Flaherty, John J., Jr.; and Wallin, Gus W., to Scovill Inc. Warming plate mounting arrangement in a single-pass drip-type electric coffeemaker. 4,356,381, Cl. 219-283.000.

Flom, Donald G.: *See*—
Komanduri, Ranga; Lee, Minyoung; Flom, Donald G.; Thompson, Robert A.; Jones, Marshall G.; and Douglas, Robert J., 4,356,376, Cl. 219-121.0LN.

Floyd, James K., to VSI Corporation. Repairable accumulator device. 4,355,662, Cl. 138-30.000.

FMC Corporation: *See*—
Ehret, Thomas M., 4,355,827, Cl. 285-98.000.

FND Company: *See*—
Nelson, Kenneth L.; and FitzGerald, David, 4,355,969, Cl. 431-4.000.

Folser, Karl: *See*—
Theurer, Josef; and Folser, Karl, 4,355,687, Cl. 171-16.000.

Ford Aerospace & Communications Corp.: *See*—
Gould, Harry J.; and Kawaguchi, Keiji, 4,356,459, Cl. 333-21.00A.

Ford Industries, Inc.: *See*—
Shefler, Gerald E.; and Weaver, Ralph J., III, 4,356,351, Cl. 179-1.00B.

Ford Motor Company: *See*—
Mangels, John A., 4,356,136, Cl. 264-65.000.

Formax, Inc.: *See*—
Richards, Louis R., 4,356,205, Cl. 426-518.000.

Forster, Daniel: *See*—
Gonin, Roger B.; Forster, Daniel; and Picquendar, Jean E., 4,356,463, Cl. 333-165.000.

Forward Graphics, Inc.: *See*—
Nelson, Richard H., 4,355,889, Cl. 355-39.000.

Foster Wheeler Energy Corporation: *See*—
Inscho, Howard P.; and Van Rhyn, Lucas H., 4,356,372, Cl. 219-60.00R.

Franchet, Alain G.: *See*—
Lagoutte, Serge; and Franchet, Alain G., 4,355,968, Cl. 425-526.000.

Francis, Thomas L.; Marhanka, John E.; and Heilich, Raymond P., to Aluminum Company of America. Noncollapsible ceramic foam. 4,356,271, Cl. 501-84.000.

Francois, Bernard; and Viguie, Jean-Claude, to Commissariat a l'Energie Atomique. Process for the production of a ceramic member having inclusions of electrically conductive material flush with its surface. 4,356,135, Cl. 264-61.000.

Frank, Peter A. Stacking containers. 4,355,485, Cl. 47-82.000.

Frantzreb, John G., Sr., to Caterpillar Tractor Co. Method and apparatus for continuous casting of hollow articles. 4,355,680, Cl. 164-484.000.

Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See*—
Theurer, Josef, 4,355,579, Cl. 104-12.000.
Theurer, Josef; and Folser, Karl, 4,355,687, Cl. 171-16.000.

Franzen, Rudolf; and Klingberg, Peter, to Buckau-Walther AG. Knocking arrangement for electric precipitation. 4,356,008, Cl. 55-112.000.

Freedman, Morris D.: *See*—
Whiteside, Arliss E.; Freedman, Morris D.; Rothschild, Alexander M.; and Tasar, Omur, 4,356,546, Cl. 364-200.000.

Freixinos, Raymond, to Compagnie Generale des Etablissements Michelin. Device for removing a tire from its rim. 4,355,675, Cl. 157-1.170.

French, Richard J.: *See*—
Rekers, Louis J.; French, Richard J.; and Mayhew, Harry W., 4,356,294, Cl. 526-100.000.

Freudenthal, William E., to GTE Laboratories Incorporated. Monetary document profile location and predetermined selected path apparatus. 4,356,473, Cl. 340-146.30H.

Frey, Volker: *See*—
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Fried. Krupp Gesellschaft mit beschrankter Haftung: *See*—
Diefendahl, Wolfgang; and Koch, Karl-Friedrich, 4,355,431, Cl. 14-27.000.

Fried. Krupp Huttenwerke AG: *See*—
Raquet, Erwin, 4,355,578, Cl. 104-1.00A.

Friggstad Manufacturing Ltd.: *See*—
Friggstad, Terrance, 4,355,689, Cl. 172-311.000.

Friggstad, Terrance, to Friggstad Manufacturing Ltd. Flexible wing implement with universal hinges and selective locking structure associated with wings thereof. 4,355,689, Cl. 172-311.000.

Frisbee, Claude M., to J.I. Case Company. Passive restraint system. 4,355,819, Cl. 280-752.000.

Fromme, Werner: *See*—
Heidjann, Franz; and Fromme, Werner, 4,355,647, Cl. 130-24.000.

Fu, Horng-Sen; Tasch, Al F., Jr.; and Chatterjee, Pallab K., to Texas Instruments Incorporated. Semiconductor device having improved interlevel conductor insulation. 4,356,040, Cl. 148-1.500.

Fu, Horng-Sen: *See*—
Tasch, Al F., Jr.; and Fu, Horng-Sen, 4,355,454, Cl. 29-571.000.

Fuji Koeki Corporation: *See*—
Takematsu, Yoshiyuki, 4,356,533, Cl. 362-17.000.

Fuji Photo Film Co., Ltd.: *See*—
Akao, Mutsuo; and Kawata, Tadashi, 4,356,224, Cl. 428-220.000.
Aotani, Yoshimasa; Kojima, Teruo; and Nakakita, Eiji, 4,356,247, Cl. 430-195.000.
Kitajima, Masao; Arai, Fuminori; and Kondo, Asaji, 4,356,149, Cl. 422-56.000.
Komaki, Takao; Matsumoto, Seiji; and Ishida, Masamitsu, 4,356,398, Cl. 250-327.200.
Saeki, Keiso; Matsukawa, Hiroharu; and Satomura, Masato, 4,356,109, Cl. 252-316.000.
Tabei, Masatoshi; Takeda, Keiji; Kawaziri, Kazuhiro; and Higashi, Akio, 4,356,246, Cl. 430-136.000.
Tachikawa, Hiromichi; Takahashi, Yohnosuke; Shinozaki, Fumiaki; and Ikeda, Tomoaki, 4,356,255, Cl. 430-325.000.
Tadokoro, Eiichi; Masuda, Haruo; Yamaguchi, Nobutaka; and Fujiyama, Masaaki, 4,356,232, Cl. 428-325.000.
Takahashi, Yohnosuke; Tachikawa, Hiromichi; Shinozaki, Fumiaki; and Ikeda, Tomoaki, 4,356,254, Cl. 430-296.000.

Fujii, Katsumi: *See*—
Saito, Hiraku; Takagahara, Isamu; Suzuki, Yasuo; Fujita. Tuyosi; Fujii, Katsumi; and Horio, Takekazu, 4,356,072, Cl. 204-180.00G.

Fujii, Masaki; and Goto, Shiro, to Mitsubishi Petrochemical Company Limited. Process for polymerizing olefins. 4,356,295, Cl. 526-125.000.

Fujimoto, Hiroaki: *See*—
Noyori, Masaharu; and Fujimoto, Hiroaki, 4,356,374, Cl. 219-121.0PE.

Fujita, Hiroo; and Tsuzuki, Akira, to Citizen Watch Company, Limited. Matrix drive system for liquid crystal display. 4,356,483, Cl. 340-805.000.

Fujita, Isao: *See*—
Sugiyama, Takeshi; Shirouchi, Shoji; Onoda, Mamoru; Kawaguchi, Fumikazu; and Fujita, Isao, 4,356,027, Cl. 75-0.50R.

Fujita, Kinya. Orthodontic appliance. 4,355,975, Cl. 433-11.000.

Fujita, Tuyosi: *See*—
Saito, Hiraku; Takagahara, Isamu; Suzuki, Yasuo; Fujita, Tuyosi; Fujii, Katsumi; and Horio, Takekazu, 4,356,072, Cl. 204-180.00G.

Fujita, Yatsuka: *See*—
Ueno, Ryuzo; Matsuda, Toshio; Kanayama, Tatsuo; Tomiyasu, Kunihiko; Fujita, Yatsuka; and Nagata, Kiyoshi, 4,356,203, Cl. 426-266.000.

Fujitsu Fanuc Limited: *See*—
Imazeki, Ryoji; and Yamazaki, Etsuo, 4,356,552, Cl. 364-474.000.
Shimajiri, Tokiji; Toyoda, Kenichi; and Yamazaki, Takahumi, 4,355,446, Cl. 29-26.00A.

Fujitsu Limited: *See*—
Imai, Hajime; Morimoto, Masahiro; and Fujiwara, Takao, 4,356,210, Cl. 427-38.000.

Fujiwara, Kazuyuki: *See*—
Yanobu, Hideo; and Fujiwara, Kazuyuki, 4,355,500, Cl. 57-279.000.

Fujiwara, Shinji: *See*—
Tanaka, Eiichiro; Yano, Kousaku; Aoki, Yoshitaka; and Fujiwara, Shinji, 4,355,866, Cl. 350-164.000.

Fujiwara, Takao: *See*—
Imai, Hajime; Morimoto, Masahiro; and Fujiwara, Takao, 4,356,210, Cl. 427-38.000.

Fujiwara, Youtaro: *See*—
Harakawa, Hiroshi; Fujiwara, Youtaro; Matsushita, Masaaki; and Tsutsui, Seiko, 4,356,222, Cl. 428-78.000.

Fujiyama, Masaaki: *See*—
Tadokoro, Eiichi; Masuda, Haruo; Yamaguchi, Nobutaka; and Fujiyama, Masaaki, 4,356,232, Cl. 428-325.000.

Fukuda, Yuji; and Kajigaya, Shinichi, to Bridgestone Tire Company Limited. Hollow marine fender. 4,355,792, Cl. 267-153.000.

Fukui, Sigeo: *See*—
Ono, Takuo; Fukui, Sigeo; and Ookura, Junichi, 4,356,544, Cl. 363-132.000.

Fukukira, Kazutoyo, to AMP Incorporated. Membrane switch. 4,356,358, Cl. 200-5.00A.

Fukunaga, Yukio: *See*—
Shimizu, Kenzo; Fukunaga, Yukio; and Tsuda, Hiroshi, 4,355,837, Cl. 296-37.120.

Fukuoka, Tatsuhiko; Ichikawa, Shigeo; and Nomichi, Satoru, to Taiho Kogyo Co., Ltd. Apparatus for manufacturing a cylindrical member. 4,355,529, Cl. 73-412.000.

Fukushima, Yoshio: *See*—
Funato, Hiroyoshi; and Fukushima, Yoshio, 4,355,858, Cl. 350-3.720.

Fulkerson, Thomas R.; and Hawkins, Royal R., to Sundstrand Corporation. Split torque transmission control. 4,355,509, Cl. 60-449.000.

Funabashi, Katsunori; and Taira, Jyoji, to Honda Giken Kogyo Kabushiki Kaisha. Fairing and headlight assembly for a two-wheeled motor vehicle. 4,356,536, Cl. 362-72.000.

Funato, Hiroyoshi; and Fukushima, Yoshio, to Ricoh Company, Ltd. Hologram lens. 4,355,858, Cl. 350-3.720.

Funk, Albert G.: *See*—
Jessop, Harvey A.; and Funk, Albert G., 4,356,044, Cl. 149-2.000.

Furuhashi, Shoji: *See*—
Asano, Masaharu; Furuhashi, Shoji; and Tamura, Hideyuki, 4,355,615, Cl. 123-437.000.

Furukawa, Mitsuhiko: *See*—
Kanemitsu, Yutaka; Hagio, Takehiko; Furukawa, Mitsuhiko; Miyahara, Michito; Hara, Yoshimichi; and Kitahira, Takashi, 4,356,272, Cl. 501-87.000.

Furukawa, Shunsuke: *See*—
Doi, Toshitada; Furukawa, Shunsuke; and Nanba, Kenji, 4,356,564, Cl. 371-40.000.

Furuya, Hiroshi; Okada, Munehisa; Takemura, Eiichiro; and Sato, Hideyo, to Mitsubishi Kasei Kogyo Kabushiki Kaisha; and Zenkoku Nogyo Kyodo Kumiai Rengo Kai. Containers adapted to contain foodstuffs. 4,355,756, Cl. 229-4.500.

Futamura, Shingo: *See*—
Bethea, Tristram W.; and Futamura, Shingo, 4,356,286, Cl. 525-183.000.

G. D. Searle & Co.: *See*—
Chorvat, Robert J.; Desai, Bipinchandra N.; and Radak, Suzanne E., 4,356,302, Cl. 544-34.000.
Deason, James R.; and Partis, Richard A., 4,356,184, Cl. 424-267.000.
Owens, William H., 4,356,118, Cl. 260-112.50R.

G. Siempelkamp GmbH & Co.: *See*—
Gotz, Wolfgang, 4,356,054, Cl. 156-517.000.

Gailey, J. Lynn; and Wollam, Carl A., to Alcan Aluminum Corporation. Process for producing striped surface coatings. 4,356,216, Cl. 427-286.000.

Gailey, J. Lynn: *See*—
Wollam, Carl A.; Gailey, J. Lynn; and Chalmers, Alexander A., 4,356,217, Cl. 427-286.000.

Gainer, Gordon C.; and Luck, Russell M., to Westinghouse Electric Corp. Compressor refrigeration system utilizing thermally stable refrigeration lubricants containing alkyl polyhalophenyl ethers. 4,355,960, Cl. 417-419.000.

Gallagher, James P.; and Yarrington, Robert M. Catalytic reforming with rhenium-platinum catalyst containing more rhenium than platinum. 4,356,081, Cl. 208-139.000.

Gambro AB: *See*—
Dahlberg, Bengt A. G.; Holmberg, Bengt M.; and Nilsson, Lennart O. E., 4,356,383, Cl. 219-308.000.

Ganssle, Eugene R., to RCA Corporation. Spacecraft separation apparatus. 4,355,775, Cl. 244-158.00R.

Garbrecht, William L., to Eli Lilly and Company. Sweetening with 5-(dihydroxyphenoxy) tetrazoles. 4,356,207, Cl. 426-548.000.

Garner, Brigitte: *See*—
Dastoli, Barbara; Garner, Brigitte; and Gorski, Ellen, 4,355,641, Cl. 128-460.000.

Garnett, Willard R.: *See*—
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Garrett Corporation, The: *See*—
Bridgnell, David G.; and Jacobsen, Frederick W., 4,355,780, Cl. 248-675.000.
Miller, David D., 4,355,987, Cl. 441-41.000.

Garrett, Donald P.: *See*—
Lenderking, Bruce N.; and Garrett, Donald P., 4,356,397, Cl. 250-231.0SE.

Gartside, Robert J.: *See*—
Woebcke, Herman N.; Bhojwani, Arju H.; and Gartside, Robert J., 4,356,151, Cl. 422-145.000.

Gat, Arnon. Method and means for heat treating semiconductor material using high intensity CW lamps. 4,356,384, Cl. 219-347.000.

Gates Rubber Company, The: *See*—
Duncan, Jock S., Jr., 4,355,990, Cl. 474-94.000.

Gaughan, Edmund J.; and Kezerian, Charles, to Stauffer Chemical Company. N-(Benzenesulfonyl) thiocarbamates - herbicidal antidotes. 4,356,025, Cl. 71-100.000.

Gedaly, Jerrell M.; Sadowski, Joseph P.; Kirkland, David D.; and Sigmund, Frank J., to Mostek Corporation. Method for fabricating a semiconductor read only memory. 4,356,042, Cl. 148-1.500.

Geiger, Warren F.: *See*—
Schmitz, Robert E.; Stearns, David T.; Stegmann, Erwin; McWhorter, Thomas E.; Geiger, Warren F.; and Abrahamsen, Thomas J., 4,355,488, Cl. 51-319.000.

Gellert, Jobst U. Sprue bushing and method of manufacture. 4,355,460, Cl. 29-611.000.

Genentech, Inc.: *See*—
Itakura, Keiichi, 4,356,270, Cl. 435-317.000.

General Atomic Company: *See*—
Cheung, Ki C.; Unkle, Truman F.; Schwartz, Arnold A.; and Hsieh, Raymond J., 4,356,144, Cl. 376-203.000.

General Battery Corporation: *See*—
Stewart, Jimmy L., 4,356,239, Cl. 429-7.000.

General Dynamics, Pomona Division: *See*—
Di Carlo, Edward F., 4,356,457, Cl. 332-3.000.
Harnagel, Gary L.; Laga, Gerry T.; Harrison, Joseph M.; and Twaddell, Victor A., 4,355,456, Cl. 29-572.000.

General Electric Company: *See*—
Aftergut, Sigfried; and Cole, Herbert S., Jr., 4,356,102, Cl. 252-299.100.
Beers, Melvin D., 4,356,116, Cl. 524-837.000.

Bray, David W.; David, John L.; and Ferris, Erman E., 4,356,490, Cl. 343-17.20R.
Crivello, James V.; and Ashby, Bruce A., 4,356,050, Cl. 156-273.300.
Gonia, Richard J., 4,356,345, Cl. 174-117.00F.
Herbst, Le Roy J.; and Preher, John L., 4,355,738, Cl. 222-129.000.
Keramati, Bahram; Bray, Steven C.; and Wood, Ralph T., 4,356,382, Cl. 219-297.000.
Komanduri, Ranga; Lee, Minyoung; Flom, Donald G.; Thompson, Robert A.; Jones, Marshall G.; and Douglas, Robert J., 4,356,376, Cl. 219-121.0LN.
Kornrumpf, William P.; and Ciccone, Joseph L., 4,356,525, Cl. 361-4.000.
Lee, Yue G. L.; and Dudgeon, Charles D., 4,356,297, Cl. 528-44.000.
Moodie, Eldon E.; and Burns, Richard D., 4,356,051, Cl. 156-459.000.
Norton, James F.; Kliman, Gerald B.; and Tompkins, Russell E., 4,356,377, Cl. 219-121.0EH.
Ostrelich, Michael J., 4,355,692, Cl. 177-211.000.
Polizzi, Emanuel V.; and Lieder, David G., 4,356,400, Cl. 378-138.000.
Russell, Ronald R., 4,356,526, Cl. 361-59.000.
Shafer, Peter O.; and Wolley, E. Duane, 4,356,503, Cl. 357-38.000.
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Weischedel, Richard C., 4,356,416, Cl. 307-570.000.
White, Dwain M., 4,356,290, Cl. 525-397.000.
Woods, Lee O.; and Haag, Donald L., 4,355,458, Cl. 29-602.00R.

General Engineering Radcliffe 1979 Limited: *See*—
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General Foods Corporation: *See*—
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Stoeckli, Oscar W.; and Berry, David J., 4,355,571, Cl. 99-485.000.

General Foods Inc.: *See*—
Todd, John M., 4,356,202, Cl. 426-138.000.

General Signal Corporation: *See*—
Bachle, Walter W., 4,355,852, Cl. 339-14.00R.
Huffman, Theron M., 4,355,660, Cl. 137-625.630.

Georg Fischer Aktiengesellschaft: *See*—
Lepere, Henri G.; and Walter, Wolfgang, 4,355,490, Cl. 51-419.000.

Georlette, Pierre; and Bouteille, Rene, to Solvay & Cie. Laminated structure for furnishing, comprising at least one decorative layer combined with a support. 4,356,226, Cl. 428-246.000.

Gerber, Arthur M., to Polaroid Corporation. Photosensitive silver halide element and method of preparing same. 4,356,257, Cl. 430-496.000.

Gerety, Robert J.: *See*—
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Gerigk, Guenter: *See*—
Hammer, Klaus-Dieter; Heinrich, Wolfgang; Gerigk, Guenter; and Bytzek, Max, 4,356,199, Cl. 426-105.000.
Hammer, Klaus-Dieter; Heinrich, Wolfgang; Gerigk, Guenter; and Bytzek, Max, 4,356,200, Cl. 426-105.000.

Germanio, Louis, to Wheaton Industries. Injection blow molding pet products. 4,356,142, Cl. 264-537.000.

Germer, John A., to Budd Company, The. Railway car tilt control system. 4,355,582, Cl. 105-164.000.

Gewerkschaft Eisenhutte Westfalia: *See*—
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Gheorghiu, Paul: *See*—
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Ghidella, Vittorio; and Cornacchia, Felice, to Fiat Auto S.p.A. Motor vehicle body. 4,355,841, Cl. 296-185.000.

Giandonato, Giuseppe: *See*—
Barcaroli, Valerio; DeMichelis, Carlo; Giandonato, Giuseppe; and Giorcelli, Silvano, 4,356,547, Cl. 364-200.000.

Gidlund, Per L. A., to Atlas Copco Aktiebolag. Pneumatic reciprocating mechanism. 4,355,564, Cl. 91-217.000.

Gie Valpron: *See*—
Berry, Jean-Luc, 4,355,573, Cl. 100-121.000.

Giken Trading Co., Ltd.: *See*—
Tsubota, Naoki; and Shibuya, Satoru, 4,356,387, Cl. 235-92.0PK.

Gilday, Montague R.: *See*—
Cram, Leonard A.; Jackson, Brian; and Gilday, Montague R., 4,356,488, Cl. 343-7.0PF.

Gill, Robert A.: *See*—
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Ginisty, Claude: *See*—
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Giorcelli, Silvano: *See*—
Barcaroli, Valerio; DeMichelis, Carlo; Giandonato, Giuseppe; and Giorcelli, Silvano, 4,356,547, Cl. 364-200.000.

Girden, Barney B. Method and apparatus for producing electricity from thermal sea power. 4,355,513, Cl. 60-641.700.

Gleeson, Bernard. Glass spinning vessel. 4,356,019, Cl. 65-346.000.

Gleim, Robert D., to Rohm and Haas Company. Polyacetylene with anthraquinone system. 4,356,301, Cl. 528-487.000.

Glennon, Timothy F., to Sundstrand Corporation. Drive circuit for parallel non-matched semiconductors. 4,356,408, Cl. 307-254.000.

Godolloi Agrartudomanyi Egyetem: *See*—
Szendro, Peter; Benko, Janos; and Szabo, Imre, 4,355,989, Cl. 474-94.000.

Goetze AG: *See*—
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Goldberg, Abraham A.; and Rossi, John P., to CBS Inc. Method and apparatus for digital television error correction without overhead bits. 4,356,507, Cl. 358-13.000.

Goldhammer, Albert. Press plate drive for a baling press. 4,355,575, Cl. 100-245.000.

Goldman, Max: *See*—
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Goldstein, Bonnie D.: *See*—
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Golf Division, Wood-Arts Company, Inc.: *See*—
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Golick, Leonard R.: *See*—
McShane, James L.; Golick, Leonard R.; and Spiegelman, Stanley R., 4,355,536, Cl. 73-633.000.

Gongwer, Dean W. Cannister type suction cleaner. 4,355,434, Cl. 15-327.00R.

Gonia, Richard J., to General Electric Company. Multiconductor cable assembly. 4,356,345, Cl. 174-117.00F.

Gonin, Roger B.; Forster, Daniel; and Picquendar, Jean E., to Thomson-CSF. Filtering device using the transfer of electrical charges into a semiconductor. 4,356,463, Cl. 333-165.000.

Gooden, Dewitt J., III: *See*—
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Goodyear Tire & Rubber Company, The: *See*—
Boon, Wyndham H.; and Sid-Ahmed, Abdel-Hadi, 4,356,219, Cl. 427-386.000.
Stafford, Willie M., 4,356,212, Cl. 427-175.000.

Goralnik, Charles D. Lighting fixture. 4,356,540, Cl. 362-294.000.

Gordon, Richard; and Ciallella, John G., to Consolidated Refining Co., Inc. Method of making ceramic lid assembly for hermetic sealing of a semiconductor chip. 4,356,047, Cl. 156-89.000.

Gorski, Anthony J.; and Schertz, William W., to United States of America, Energy. Passive ice freezing-releasing heat pipe. 4,355,522, Cl. 62-340.000.

Gorski, Ellen: *See*—
Dastoli, Barbara; Garner, Brigitte; and Gorski, Ellen, 4,355,641, Cl. 128-460.000.

Goto, Shiro: *See*—
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Gotz, Wolfgang, to G. Siempelkamp GmbH & Co. Device for feeding metal-foil sections to a laminating station. 4,356,054, Cl. 156-517.000.

Gould, Harry J.; and Kawaguchi, Keiji, to Ford Aerospace & Communications Corp. Flat phase response septum polarizer. 4,356,459, Cl. 333-21.00A.

Gould, Kenneth W.: *See*—
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Gould, Norman P.: *See*—
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Cragoe, Edward J., Jr.; Stokker, Gerald E.; and Gould, Norman P., 4,356,314, Cl. 560-53.000.

Graef, Harry T.; Mercer, Scott A.; Hill, Jeffrey A.; and Newton, Kevin H., to Diebold Incorporated. Picker mechanism for automatic banking machines. 4,355,797, Cl. 271-20.000.

Graeme, Jerald G., to Burr-Brown Research Corporation. Integrated heating element and method for thermal testing and compensation of integrated circuits. 4,356,379, Cl. 219-209.000.

Graf, Ronald E. Droplet control aspects—ink evaporation reduction; low voltage contact angle control device; droplet trajectory release modes; uses for metallic ink drops in circuit wiring and press printing. 4,356,500, Cl. 346-75.000.

Graham, Anne M.: *See*—
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Graham, Dennis I., to Incom International Inc. Clamp-to-bulkhead adapters for push pull cable end fittings. 4,355,920, Cl. 403-195.000.

Graham, Lewis N. Air inlet fuel saver device for internal combustion engines. 4,355,623, Cl. 123-585.000.

Grandini, Angelo: *See*—
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Green, Michael D.: *See*—
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Greenstreet, James G. Vibration isolating surface protector with high traction properties. 4,355,777, Cl. 248-346.000.

Gregonis, Donald E.: *See*—
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Gregory, James E. Gate latch. 4,355,829, Cl. 292-68.000.

Gregory, Joseph L., III, to Philip Morris Incorporated. Web sectioning apparatus including an interference indicator. 4,355,554, Cl. 83-37.000.

Greig, David A.: *See—*
Katzman, James A.; Bartlett, Joel F.; Bixler, Richard M.; Davidow, William H.; Despotakis, John A.; Graziano, Peter J.; Green, Michael D.; Greig, David A.; Hayashi, Steven J.; Mackie, David R.; McEvoy, Dennis L.; Treybig, James G.; and Wierenga, Steven W., 4,356,550, Cl. 364-200.000.

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Griffith, James R.; and O'Rear, Jacques G., to United States of America, Navy. Fluorinated diacrylic esters and polymers therefrom. 4,356,296, Cl. 526-242.000.

Griffiths, William C., to Midland-Ross Corporation. System of moisture and temperature conditioning air using a solar pond. 4,355,683, Cl. 165-60.000.

Grim, Gary. Roller skate sole. 4,355,474, Cl. 36-132.000.

Grohn, Michael, to Daimler-Benz Aktiengesellschaft. Exhaust gas turbocharger. 4,355,503, Cl. 60-602.000.

Grose, Ronald D., to InterNorth, Inc. Full admission pitot pump. 4,355,951, Cl. 415-89.000.

Gross, Benjamin, to Mobil Oil Corporation. Heat balance in FCC process. 4,356,082, Cl. 208-164.000.

Grundig E.M.V.: *See—*
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Grunert, Margarete; and Tesmann, Holger, to Henkel Kommanditgesellschaft auf Aktien. Fertilizer compositions containing alkylene oxide adduct anticaking agents. 4,356,020, Cl. 71-27.000.

Gschwend, Heinz W., to Ciba-Geigy Corporation. Dibenz[c,e]azepines. 4,356,176, Cl. 424-244.000.

GTE Automatic Electric Labs Inc.: *See—*
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GTE Laboratories Incorporated: *See—*
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GTE Products Corporation: *See—*
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Gudzin, Martin G., to Teledyne Industries, Inc., Geotech Division. Pressure sensitive intrusion sensing line. 4,356,423, Cl. 310-338.000.

Gulf Oil Corporation: *See—*
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Gulf Research & Development Company: *See—*
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Guntner, Helmut; and Wittenzellner, Ernst, to Siemens Aktiengesellschaft. Monolithically integrable logic circuit. 4,356,414, Cl. 307-455.000.

Gutsch, Uwe: *See—*
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Guy F. Atkinson Company: *See—*
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Gyugyi, Laszlo: *See—*
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Gyurics, Karoly: *See—*
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Hacoba Textilmaschinen GmbH & Co. KG: *See—*
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Hagelberg, Gabriella, to Bengt Petersson New Products Investment AB. Grammophone record sleeve. 4,355,718, Cl. 206-312.000.

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Hall, David J.: *See—*
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Hall, Edward N., to Chromalloy American Corporation. Exo-electron non-destructive test device and method. 4,355,538, Cl. 73-811.000.

Hall, Gunnar B. Rope-lock. 4,355,441, Cl. 24-134.0KB.

Hallcher, Richard C.: *See—*
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Halpin, Peter T.; and Zarur, George L., to World Resources Company. Safe disposal of metal values in slag. 4,356,030, Cl. 75-21.000.

Hamburg, Frances P.: *See—*
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Hamilton, Noble E.: *See—*
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Hamm, Nicholas; and Rosbak, John, to Deere & Company. Agricultural implement and depth control therefor. 4,355,688, Cl. 172-4.000.

Hammer, Klaus-Dieter; Heinrich, Wolfgang; Gerigk, Guenter; and Bytzek, Max, to Hoechst Aktiengesellschaft. Tubular packaging material and method for its manufacture. 4,356,199, Cl. 426-105.000.

Hammer, Klaus-Dieter; Heinrich, Wolfgang; Gerigk, Guenter; and Bytzek, Max, to Hoechst Aktiengesellschaft. Tubular packaging material and method for its manufacture. 4,356,200, Cl. 426-105.000.

Hanagata, Takayoshi, to Canon Kabushiki Kaisha. Desk-top calculator. 4,356,386, Cl. 235-61.0PK.

Haney, Ivan L. Tie connectors. 4,355,444, Cl. 24-129.00B.

Haniet, Jacques M., to Intent Patent, A.G. Lighting system. 4,356,428, Cl. 313-485.000.

Hann, Reuben L.: *See—*
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Hannam, Stephen J., to Warwick Chemical Limited. Production of N,N,N',N'-tetraacetylethylenediamine. 4,356,321, Cl. 564-144.000.

Hannes, Heinz D.; Lothmann, Josef; and Walther, Ludwig, to Zimmermann & Jansen GmbH. Method of controlling the nozzle damper of a metallurgical vessel. 4,355,787, Cl. 266-92.000.

Hara, Yoshimichi: *See—*
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Harakawa, Hiroshi; Fujiwara, Youtaro; Matsushita, Masaaki; and Tsutsui, Seiko, to Ube Industries, Ltd. Fusion-bondable sheet. 4,356,222, Cl. 428-78.000.

Harbauer, Werner; and Wiessner, Edgar, to Siemens Aktiengesellschaft. Locking device for contact carriers. 4,356,363, Cl. 200-50.00C.

Hardin, Gerald D.: *See—*
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Hardin, James C.; and Hardin, Gerald D. Fuel burning heater. 4,355,624, Cl. 126-66.000.

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Harman International Industries, Inc.: *See—*
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Harper, William P.; and Taylor, Michael J., to Rogers Corporation. Circuitry component. 4,356,366, Cl. 200-159.00B.

Harrison, James J.; Sabourin, Edward T.; and Selwitz, Charles M., to Gulf Research & Development Company. Process for preparation of acetylene terminated sulfones, oligomers and precursors therefor. 4,356,325, Cl. 568-33.000.

Harrison, Joseph M.: *See—*
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Harvey, Kenneth; Connors, Stephen T.; and Baines, Eric, to Colgate-Palmolive Company. Opacified dental cream containing a binary fluorine-providing system. 4,356,168, Cl. 424-52.000.

Hasegawa, Akira, to Toyota Jidosha Kogyo Kabushiki Kaisha. Throttle linkage system in an automobile provided with an internal combustion engine. 4,355,611, Cl. 123-396.000.

Hasegawa, Jun: *See—*
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Hasegawa, Takao: *See*—
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Hasegawa, Yasuo: *See*—
Ikeda, Jun-ichi; and Hasegawa, Yasuo, 4,355,532, Cl. 73-11.000.
Hashimoto Forming Kogyo Co., Ltd.: *See*—
Ookubo, Takao; Baba, Yuko; and Kamihama, Kiyoshi, 4,355,848, Cl. 301-37.0SS.
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Hatanaka, Yasuaki: *See*—
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Hatano, Kazunori; Nakamichi, Masanari; and Akiyama, Shun-ichi, to Takeda Chemical Industries, Ltd. Method for the production of antibiotic C-15003 P-3. 4,356,265, Cl. 435-119.000.
Hattiangadi, Uday S., to Conoco Inc. Recirculating flue gas fluidized bed heater. 4,355,601, Cl. 122-4.00D.
Hatton, Derald R.; and Chupka, David E., to Black Clawson Company, The. Self-sealing valve assembly to facilitate unplugging of a centrifugal cleaner. 4,356,084, Cl. 209-211.000.
Hattori, Kenji: *See*—
Kiuchi, Mitsuyuki; Mizukawa, Takumi; Kominami, Hideyuki; and Hattori, Kenji, 4,356,371, Cl. 219-10.770.
Hattori, Shinichiro, to Olympus Optical Co., Ltd. Light supply device for an endoscope. 4,356,534, Cl. 362-32.000.
Hau-Chun Ku, Edward; and Rohrer, Gene D., to International Business Machines Corporation. Character recognition system. 4,356,472, Cl. 340-146.30C.
Hauser, Hans: *See*—
Reinhard, Anton J.; and Hauser, Hans, 4,355,549, Cl. 74-850.000.
Hawkins, Royal R.: *See*—
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Hayakawa, Seiji: *See*—
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Hayashi, Kunihisa; and Moriyama, Masakazu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Electronic fuel injection control apparatus of an internal combustion engine. 4,355,614, Cl. 123-436.000.
Hayashi, Steven J.: *See*—
Katzman, James A.; Bartlett, Joel F.; Bixler, Richard M.; Davidow, William H.; Despotakis, John A.; Graziano, Peter J.; Green, Michael D.; Greig, David A.; Hayashi, Steven J.; Mackie, David R.; McEvoy, Dennis L.; Treybig, James G.; and Wierenga, Steven W., 4,356,550, Cl. 364-200.000.
Hayashida, Yoshihiro: *See*—
Kubota, Hitoshi; Takahashi, Toshiyuki; and Hayashida, Yoshihiro, 4,355,512, Cl. 60-534.000.
Hayward, Robert D. Coax push-on test connector. 4,355,857, Cl. 339-177.00R.
Heady, Robert E., to CPC International Inc. Process for the production of high fructose syrups and ethanol. 4,356,262, Cl. 435-97.000.
Healey, William E.; and Heineman, Morse R., to W. E. Healey & Associates, Inc. Multiple alarm detector monitoring and command system. 4,356,476, Cl. 340-522.000.
Heard, Thomas J.: *See*—
Arendt, Henry P.; and Heard, Thomas J., 4,355,686, Cl. 166-313.000.
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Heavin, Leonard J.; King, Edward E.; and Milliron, Dennis L., to Pittsburg & Midway Coal Mining Co., The. Process for blending coal with water immiscible liquid. 4,356,078, Cl. 208-8.0LE.
Heberlein, Joachim V. R.: *See*—
Down, Michael G.; Heberlein, Joachim V. R.; and Meyer, Thomas N., 4,356,029, Cl. 75-0.50B.
Heidjann, Franz; and Fromme, Werner, to Claas Ohg. Device for distributing screen material. 4,355,647, Cl. 130-24.000.
Heilbrun, Harold. Adjustable multi-function rotary exercise apparatus. 4,355,633, Cl. 128-25.00R.
Heilich, Raymond P.: *See*—
Francis, Thomas L.; Marhanka, John E.; and Heilich, Raymond P., 4,356,271, Cl. 501-84.000.
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Heinrich, Wolfgang: *See*—
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Hammer, Klaus-Dieter; Heinrich, Wolfgang; Gerigk, Guenter; and Bytzek, Max, 4,356,200, Cl. 426-105.000.
Heled, Simca. Collapsible stand for sheet music and the like. 4,355,779, Cl. 248-460.000.
Helenius, Ari: *See*—
Simons, Kai; and Helenius, Ari, 4,356,169, Cl. 424-89.000.
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Helix Technology Corporation: *See*—
Kercheval, John E.; and Nicoll, Harry G., 4,355,519, Cl. 62-6.000.
Hellmer, Ernest W., to Continental Group, Inc., The. Label applying device. 4,355,967, Cl. 425-503.000.
Hendrickson, Thomas E.: *See*—
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Henkel Corporation: *See*—
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Grunert, Margarete; and Tesmann, Holger, 4,356,020, Cl. 71-27.000.
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Herbreteau, Louis, to Commissariat a l'Energie Atomique. Sounding apparatus. 4,356,487, Cl. 343-5.00W.
Herbst, Le Roy J.; and Preher, John L., to General Electric Company. Treaty agent dispensing apparatus for a washing appliance. 4,355,738, Cl. 222-129.000.
Herbstman, Sheldon: *See*—
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Hercules Incorporated: *See*—
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Herloski, Robert P.; Norton, James R.; and Antos, Ronald L., to Xerox Corporation. Field replaceable laser apparatus for raster scanner. 4,355,859, Cl. 350-6.100.
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Slusser, Boyd C., 4,355,851, Cl. 312-215.000.
Hertell, Siegfried; Kirchherr, Claus; Kahl, Horst; and Hoffmann, Siegfried, to Barmag Barmer Maschinenfabrik. Hydraulic control apparatus for load independent flow regulation. 4,355,655, Cl. 137-117.000.
Hertzberg, Samuel. Vacuum cleaners. 4,355,436, Cl. 15-383.000.
Hess, Peter; Rampel, Hans; and Schulz, Volkmar, to Metallwerk Max Brose GmbH & Co. Adjusting device for a seat. 4,355,778, Cl. 248-429.000.
Hesse, Renke: *See*—
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Hetet, Yves J. F.: *See*—
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Hewitt, Robert R.: *See*—
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Hewlett-Packard Company: *See*—
Thomas, Paul L., 4,356,449, Cl. 328-145.000.
Heyer, Raymond F.; and Lovness, William R., to Minnesota Mining and Manufacturing Company. Abrasive article comprising abrasive agglomerates supported in a fibrous matrix. 4,355,489, Cl. 51-400.000.
Hi-Shear Corporation: *See*—
Rosman, Irwin E., 4,355,531, Cl. 72-479.000.
Hickman, John S. Motorcycle fairing. 4,355,838, Cl. 296-78.100.
Higashi, Akio: *See*—
Tabei, Masatoshi; Takeda, Keiji; Kawaziri, Kazuhiro; and Higashi, Akio, 4,356,246, Cl. 430-136.000.
Higgins, Robert D., to Petrochem Consultants, Inc. Cryogenic recovery of liquids from refinery off-gases. 4,356,014, Cl. 62-28.000.
Hill, Alan H.; and Lord, Alan, to General Engineering Radcliffe 1979 Limited. Apparatus for and a method of curing a continuous length of curable material. 4,356,143, Cl. 264-557.000.
Hill, Jeffrey A.: *See*—
Graef, Harry T.; Mercer, Scott A.; Hill, Jeffrey A.; and Newton, Kevin H., 4,355,797, Cl. 271-20.000.
Hiller von Gaertringen, Johann C. F. Apparatus for removing branches and bark from felled trees. 4,355,672, Cl. 144-208.00E.
Hilliard Corp., The: *See*—
Kelchner, Jay R., 4,355,659, Cl. 137-625.190.
Hilliges, Friedrich, to Siemens Aktiengesellschaft. Circuit arrangement for telephone exchange systems having time staggered charge metering pulse frequencies. 4,356,352, Cl. 179-7.10R.
Hinds, Sally K.; Weiler, Peter M.; and Hewitt, Robert R., to National Semiconductor Corporation. Mechanical shock and impact resistant ceramic semiconductor package and method of making the same. 4,355,719, Cl. 206-334.000.
Hira, Kazumi, to Nissan Motor Co., Ltd. Kicking plate mounting structure. 4,355,842, Cl. 296-199.000.
Hirooka, Masami; and Harada, Denzaburo, to Kubota Ltd. Working vehicle. 4,355,693, Cl. 180-6.480.
Hirose, Minoru, to Tokyo Shibaura Denki Kabushiki Kaisha. Bank note depositing device for a transaction machine. 4,355,711, Cl. 194-4.00C.
Hirota, Yukitsugu; Endo, Akira; and Sekine, Kenji, to Hitachi, Ltd.; and Nissan Motor Co., Ltd. Vehicle speed sensing apparatus with electromagnetic wave interference detector. 4,356,489, Cl. 343-7.0VM.
Hirschmann, Josef: *See*—
Iwaischenko, Peter; and Hirschmann, Josef, 4,355,638, Cl. 128-214.00F.
Hitachi Chemical Co., Ltd.: *See*—
Kumagai, Yugo, 4,356,285, Cl. 525-111.000.
Hitachi, Ltd.: *See*—
Hirota, Yukitsugu; Endo, Akira; and Sekine, Kenji, 4,356,489, Cl. 343-7.0VM.
Ienaka, Masanori, 4,356,350, Cl. 179-1.0GJ.
Kosa, Yasunobu, 4,356,041, Cl. 148-1.500.
Masuda, Kouji; Mizukami, Masao; and Kitamura, Nobuaki, 4,356,409, Cl. 307-264.000.
Saito, Tadashi; Nakajima, Toshihiko; and Osada, Toshio, 4,356,437, Cl. 318-254.000.

Shimizu, Norio; Odawara, Yoji; and Masaki, Yasunori, 4,356,092, Cl. 210-611.000.
Shimizu, Norio; Odawara, Yoji; and Masaki, Yasunori, 4,356,268, Cl. 435-253.000.
Hitachi Ome Electric Co., Ltd.: *See*—
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Hochtemperatur-Reaktorbau GmbH: *See*—
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Hockin, Harry W., deceased (by Hockin, Jane S., executrix); Bracanin, Brian F.; Clements, Ronald J.; Keran, Vitie P.; and Baker, Alan C., to Direct Reduction Corporation, The. Apparatus and method for controlling the recycle char circuit in a direct reduction process. 4,356,031, Cl. 75-36.000.
Hockin, Jane S., executrix: *See*—
Hockin, Harry W., deceased; Bracanin, Brian F.; Clements, Ronald J.; Keran, Vitie P.; and Baker, Alan C., 4,356,031, Cl. 75-36.000.
Hoechst Aktiengesellschaft: *See*—
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Hammer, Klaus-Dieter; Heinrich, Wolfgang; Gerigk, Guenter; and Bytzek, Max, 4,356,200, Cl. 426-105.000.
Moraw, Roland; and Schadlich, Renate, 4,356,052, Cl. 156-498.000.
Weinlich, Jurgen; Plewan, Otto; Leugering, Hans-Joachim, deceased; Leugering nee Wegener, Ursula M., heiress; Leugering, Lothar, heir; Leugering, Manfred, heir; Bahn nee Leugering, Rita, heiress; and Leugering, Gunter, heir, 4,356,283, Cl. 524-504.000.
Wiezer, Hartmut; Nowy, Gunther; and Haberlein, Harald, 4,356,308, Cl. 546-242.000.
Hofberg, Robert; Goldstein, Bonnie D.; and Wepner, Roy H. Package for dispensing precut tape segments. 4,355,720, Cl. 206-460.000.
Hofer, Leo, to Nordtool AB. Shears for sheet metal cutting. 4,355,558, Cl. 83-587.000.
Hoffmann, Hellmut, to Bayer Aktiengesellschaft. Preparation of 3-(2,2-dichloro-vinyl)-2,2-dimethyl-cyclopropane-1-carboxylic acid derivatives. 4,356,127, Cl. 260-464.000.
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Hoffmann, Siegfried: *See*—
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Hofstetter, Jack H., to American Hospital Supply Corporation. Medical liquid container with filter vent. 4,356,012, Cl. 55-385.00C.
Hoglund, Hans E.; and Peterson, Per V., to SCA Development Aktiebolag. Chip treatment. 4,356,213, Cl. 427-212.000.
Hollier, Joseph H., Jr., to Sutco, Inc. Transfer mechanism in the winding of stock material. 4,355,771, Cl. 242-56.00R.
Holmberg, Bengt M.: *See*—
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Holmgren, Lars; and Holmgren, Per-Martin, to Aktiebolaget P. E. Holmgren. Working machine with improved jib section. 4,355,477, Cl. 37-117.500.
Holmgren, Per-Martin: *See*—
Holmgren, Lars; and Holmgren, Per-Martin, 4,355,477, Cl. 37-117.500.
Homeier, Ronald F., to PT Components, Inc. Welded wire link roller chain. 4,355,993, Cl. 474-231.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Funabashi, Katsunori; and Taira, Jyoji, 4,356,536, Cl. 362-72.000.
Honda, Haruhisa; Toyono, Tsutomu; Nakamura, Shunji; Tanaka, Kano; and Kimura, Yoshimasa, to Canon Kabushiki Kaisha. Electrophotographic apparatus. 4,355,884, Cl. 355-14.0CH.
Honeywell Inc.: *See*—
Bartels, James I., 4,356,406, Cl. 307-118.000.
Johnson, Robert G.; and Hendrickson, Thomas E., 4,356,150, Cl. 422-98.000.
Mott, Richard C.; and Smulkstys, Louis S., 4,356,439, Cl. 318-685.000.
Honig, Gunter; Kiencke, Uwe; and Bone, Rainer, to Robert Bosch GmbH. System and apparatus to determine the angular position, and speed of a rotating shaft, particularly crank shaft of an internal combustion engine. 4,356,447, Cl. 324-169.000.
Honig, Helmut; Leitner, Wolfgang; and Pampouchidis, Georg, to Vianova Kunstharz, A.G. Binder combination for cathodically depositable paints. 4,356,276, Cl. 523-404.000.
Hooks, Haywood, Jr.: *See*—
Wojtowicz, John A.; and Hooks, Haywood, Jr., 4,356,303, Cl. 544-192.000.
Horikoshi, Kouki: *See*—
Shibanai, Ichiro; Horikoshi, Kouki; and Nakamura, Nobuyuki, 4,356,115, Cl. 252-522.00A.
Horinouchi, Atsushi, to Sanyo Electric Co., Ltd. Apparatus for controlling electronic controlled cooking apparatus. 4,356,370, Cl. 219-10.55B.
Horio, Takekazu: *See*—
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Horton, Philip G.: *See*—
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Hoshikawa, Katuyuki: *See*—
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Hosoi, Sadao: *See*—
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Hosono, Nagao; Kinoshita, Koichi; and Takahashi, Toru, to Canon Kabushiki Kaisha. Method and apparatus for electrophotographic, image development with magnetic toner. 4,356,245, Cl. 430-122.000.
Hostetler, Ronald E., to Crown Zellerbach Corporation. High bulk papermaking system. 4,356,059, Cl. 162-111.000.
Hostetler, Thomas E.; and Ellis, Ted J., Jr., to Bristol Corporation. Guard apparatus. 4,356,369, Cl. 200-334.000.
Houston, Nicholas J.: *See*—
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HPM Corporation: *See*—
Kruder, George A., 4,356,140, Cl. 264-176.00R.
Hsieh, Raymond J.: *See*—
Cheung, Ki C.; Unkle, Truman F.; Schwartz, Arnold A.; and Hsieh, Raymond J., 4,356,144, Cl. 376-203.000.
Hsu, Ying Y., to Timex Corporation. 4-Substituted phenyl 4-(5n-alkyl-1,3-dioxan-2-yl)benzoates. 4,356,104, Cl. 252-299.610.
Hucks, Uwe; Tresper, Erhard; and Wulff, Claus, to Bayer Aktiengesellschaft. Process for the preparation of neutral phosphorous acid aryl esters. 4,356,129, Cl. 260-973.000.
Huffman, Theron M., to General Signal Corporation. Pneumatically controlled, four position hydraulic valve. 4,355,660, Cl. 137-625.630.
Hughes Aircraft Company: *See*—
Shen, Peter I., 4,356,565, Cl. 372-61.000.
Hultquist, Joe H. Process for treating alfalfa and other cellulosic agricultural crops. 4,356,196, Cl. 426-69.000.
Human Oltoanyagtermelo es Kutato Intezet: *See*—
Bar, Vilmos; Boszormenyi, Joszef; Richter, Peter; Mercz, Jeno; and Rozsnyai, Tamas, 4,356,306, Cl. 546-176.000.
Humphrey, Gerald A. Joint device for stacking apparatus. 4,355,725, Cl. 211-49.00R.
Humphries, Peter; and Aeberli, Paul, to Contronic Controls Limited. Alarm system. 4,356,474, Cl. 340-509.000.
Hunt, A. H., III: *See*—
Selim, Harold N., 4,356,521, Cl. 360-72.200.
Huntsinger, James E.: *See*—
Williams, David W.; Jordan, James L.; and Huntsinger, James E., 4,356,208, Cl. 426-592.000.
Husemann, Heinz; and Linde, Klaus, to Gewerkschaft Eisenhutte Westfalia. Tunnel-driving apparatus. 4,355,924, Cl. 405-145.000.
Hutchinson, William R.: *See*—
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Ichikawa, Shigeo: *See*—
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Ienaka, Masanori, to Hitachi, Ltd. FM Receiver. 4,356,350, Cl. 179-1.0GJ.
Igarashi, Isao, to Toyota Jidosha Kabushiki Kaisha. Transmission control system for a combination car system. 4,355,694, Cl. 180-14.00R.
Iida, Yasuo; Suzuki, Katumi; and Endo, Nobuhiro, to Nippon Electric Co., Ltd. Semiconductor device having a registration mark for use in an exposure technique for micro-fine working. 4,356,223, Cl. 428-156.000.
Iizuka, Mitsuru, to Nissan Motor Company, Limited. Ash tray assembly for an automobile. 4,355,836, Cl. 296-37.900.
Ikarus Karosszeria- es Jarmugyar: *See*—
Szendrodi, Valer; Radics, Gyula; Varga, Tivadar; Vass, Tibor; and Gyurics, Karoly, 4,355,840, Cl. 296-179.000.
Ikeda, Jun-ichi; and Hasegawa, Yasuo, to Tokico Kabushiki Kaisha. Apparatus for testing damping forces of shock absorbers. 4,355,532, Cl. 73-11.000.
Ikeda, Noriaki: *See*—
Nakanishi, Yoshiyuki; Akazawa, Yoji; Ikeda, Noriaki; and Suzuki, Takehiko, 4,356,112, Cl. 252-435.000.
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Takahashi, Yohnosuke; Tachikawa, Hiromichi; Shinozaki, Fumiaki; and Ikeda, Tomoaki, 4,356,254, Cl. 430-296.000.
Ikedo, Yuji, to Pioneer Electronic Corporation. Control apparatus in automatic audio disc player. 4,356,561, Cl. 369-225.000.
Ikemoto, Kazuhito; Katayama, Nobuaki; Terakura, Yukio; and Sasaki, Kan, to Toyota Jidosha Kogyo Kabushiki Kaisha. Device for supporting a shift lever in a manual transmission for an automobile. 4,355,543, Cl. 74-473.00P.
Ikenoue, Tsuneo; Liu, Shin-yng; Umemoto, Shuichi; and Arai, Naoki, to Ikenoue, Tsuneo; Tohoku Ricoh Co. Ltd.; Stanley Electric Co., Ltd.; and Micron Kiki Co., Ltd. Rectifier. 4,356,541, Cl. 363-20.000.
Ikeura, Kenji: *See*—
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Ilitzky, Zelik M. Molded shoe. 4,355,473, Cl. 36-11.500.
Imaeda, Kozo: *See*—
Matsumoto, Tadayuki; Imaeda, Kozo; Mineo, Masatoshi; and Nakagawa, Kiyoshi, 4,355,445, Cl. 28-274.000.
Imai, Hajime; Morimoto, Masahiro; and Fujiwara, Takao, to Fujitsu Limited. Method for forming a protecting film on side walls of a semiconductor device. 4,356,210, Cl. 427-38.000.
Imai, Tamotsu, to UOP Inc. Synthesis of alcohols. 4,356,334, Cl. 568-909.000.

Imaizumi, Masao; Takezono, Tetsuya; Amari, Takaaki; and Oguchi, Yutaka, to Nippon Oil Company, Limited. Process for isolating and recovering butene-1 of high purity. 4,356,339, Cl. 585-829.000.
Imazeki, Ryoji; and Yamazaki, Etsuo, to Fujitsu Fanuc Limited. Tracer control equipment. 4,356,552, Cl. 364-474.000.
IMDEC S.R.L.: *See—*
Silvestrini, Jesus A., 4,355,572, Cl. 99-516.000.
Imperial Chemical Industries Limited: *See—*
Bain, David; Martin, John E.; Saul, John H.; and Winterton, Neil, 4,356,038, Cl. 134-2.000.
Brooks, Herbert; and Waite, Frederick A., 4,356,003, Cl. 44-62.000.
Cowen, Geoffrey; Norton-Berry, Philip; and Steel, Margaret L., 4,356,133, Cl. 264-8.000.
Norval, Stephen V.; and Jones, Peter J. V., 4,356,159, Cl. 423-481.000.
Imperial Chemical Industries PLC: *See—*
Coffee, Ronald A., 4,356,528, Cl. 361-226.000.
Imperial Group Limited: *See—*
Vaughan, Roger, 4,355,535, Cl. 73-37.800.
Inagaki, Mitsukane: *See—*
Kono, Hiroya; Hasegawa, Jun; Inagaki, Mitsukane; and Kobayashi, Hisao, 4,355,959, Cl. 417-223.000.
Incom International Inc.: *See—*
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Miller, Kenneth Y.; and Hutchinson, William R., 4,356,006, Cl. 55-55.000.
Riggs, Thomas C., 4,355,961, Cl. 417-494.000.
Inoshita, Yasushi: *See—*
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Inoue, Minoru: *See—*
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Inoue, Mitsumasa, to Nissan Motor Co., Ltd. Air/fuel mixture heating device for internal combustion engine. 4,355,622, Cl. 123-548.000.
Inoue, Takehisa; and Miwa, Kishio, to Toray Industries, Incorporated. Process for separating an alkylphenol isomer. 4,356,331, Cl. 568-758.000.
Inoue, Yasuhiro: *See—*
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Inscho, Howard P.; and Van Rhyn, Lucas H., to Foster Wheeler Energy Corporation. Sheiled-arc tube welder with intermediate gas supply. 4,356,372, Cl. 219-60.00R.
Institut de Recherche Scientifique "I.R.S.": *See—*
Pacheco, Henri; Descours-Saint-Martino, Marie-Ange; Yavordios, Demetre; and Koeberle, Jean, 4,356,188, Cl. 424-317.000.
Intensity-Filter GmbH & Co. KG: *See—*
Meyer zu Riemsloh, Heinz, 4,356,010, Cl. 55-302.000.
Intent Patent, A.G.: *See—*
Hanlet, Jacques M., 4,356,428, Cl. 313-485.000.
International Business Machines Corporation: *See—*
Alexander, James S., 4,355,914, Cl. 400-690.100.
Hau-Chun Ku, Edward; and Rohrer, Gene D., 4,356,472, Cl. 340-146.30C.
Kienle, Helmut; Schmid, Gerhard E.; Steiner, Werner; and Trippel, Gerhard, 4,356,066, Cl. 204-38.00A.
Mack, Alfred; O'Neill, Brian C.; and Penzetta, Fred L., 4,355,937, Cl. 414-217.000.
Riseman, Jacob, 4,356,211, Cl. 427-85.000.
Rosenbluth, William; and Williams, Thomas A., 4,356,413, Cl. 307-443.000.
Rutkowski, Edward V., Jr., 4,355,913, Cl. 400-63.000.
International Microcircuits, Inc.: *See—*
Tozun, Orhan N., 4,356,504, Cl. 357-42.000.
International Minerals & Chemical Corp.: *See—*
Martin, Jerome L., 4,356,264, Cl. 435-119.000.
International Telephone and Telegraph Corporation: *See—*
Emanuel, Peter R.; Salman, Syed; and Mohiuddin, Gulam, 4,356,230, Cl. 428-290.000.
InterNorth, Inc.: *See—*
Grose, Ronald D., 4,355,951, Cl. 415-89.000.
Intertractor Viehmann GmbH & Co., Firma: *See—*
Klaus, Helmuth; Lause, Heinz; and Brunn, Hansjoachim, 4,355,988, Cl. 474-91.000.
Inventa AG fur Forschung und Patentverwertung: *See—*
Isler, Walter; and Schmid, Eduard, 4,356,300, Cl. 528-324.000.
Inventio AG: *See—*
Schroder, Joris; Bosshard, Hans; Kiml, Jiri; Kostka, Miroslav; and Zimmermann, Walter, 4,355,705, Cl. 187-29.00R.
Ipco Corporation: *See—*
Weissman, Bernard, 4,355,979, Cl. 433-225.000.
Ippolitov, Vladimir V.: *See—*
Kapitanov, Nikolai N.; Petrova, Natalya P.; Judenich, Vsevolod V.; Kharchenko, Vladimir P.; Smirnov, Boris A.; Ippolitov, Vladimir V.; and Lankina, Nadezhda M., 4,355,731, Cl. 227-19.000.
Irani, Nayyir F.; and Maier, Thomas O., to Eastman Kodak Company. Use of zinc salts to increase dye stability. 4,356,250, Cl. 430-216.000.
IRECO Chemicals: *See—*
Jessop, Harvey A.; and Funk, Albert G., 4,356,044, Cl. 149-2.000.
Ishiai, Hideyuki: *See—*
Yoshimura, Norihiko; Niiho, Masaaki; Kamasako, Shoji; and Ishiai, Hideyuki, 4,356,513, Cl. 358-213.000.
Ishida, Hiroaki: *See—*
Kitai, Kiyoshi; Nakagawa, Tadashi; and Ishida, Hiroaki, 4,355,872, Cl. 354-25.000.
Ishida, Masamitsu: *See—*
Komaki, Takao; Matsumoto, Seiji; and Ishida, Masamitsu, 4,356,398, Cl. 250-327.200.
Ishii, Satoshi: *See—*
Ozawa, Akio; Sueyoshi, Susumu; Saito, Keishi; Ishikawa, Kikuo; Yatsuhashi, Kiyomi; Ishii, Satoshi; and Yumino, Masamichi, 4,356,455, Cl. 330-296.000.
Ishijima, Koji: *See—*
Tanaka, Hideharu; Ishijima, Koji; and Koda, Toshihide, 4,355,963, Cl. 418-63.000.
Ishikawa, Kikuo: *See—*
Ozawa, Akio; Sueyoshi, Susumu; Saito, Keishi; Ishikawa, Kikuo; Yatsuhashi, Kiyomi; Ishii, Satoshi; and Yumino, Masamichi, 4,356,455, Cl. 330-296.000.
Sueyoshi, Susumu; and Ishikawa, Kikuo, 4,356,454, Cl. 330-294.000.
Ishikawa, Shozo; Katagiri, Kazuharu; Watanabe, Katsunori; Ohta, Shigeto; and Kitahara, Makoto, to Copyer Co., Ltd. Electrophotographic media with benzoxazole group containing dis-azo compound. 4,356,243, Cl. 430-58.000.
Ishikawa, Toshikatsu; Teranishi, Haruo; Yokoyama, Akira; Yanagi, Tetsuo; and Harada, Hirofumi, to Nippon Carbon Co., Ltd. Process for producing carbon fibers. 4,356,158, Cl. 423-447.400.
Isler, Walter; and Schmid, Eduard, to Inventa AG fur Forschung und Patentverwertung. Polyetherpolyamide copolymers. 4,356,300, Cl. 528-324.000.
Iso, Tadashi: *See—*
Iwao, Junichi; Oya, Masayuki; Baba, Toshio; Iso, Tadashi; and Chiba, Takehisa, 4,356,183, Cl. 424-263.000.
Itakura, Keiichi, to Genentech, Inc. Recombinant DNA cloning vehicle. 4,356,270, Cl. 435-317.000.
Ito, Rintaro: *See—*
Takahashi, Teruo; and Ito, Rintaro, 4,355,459, Cl. 29-605.000.
Ito, Toshimitsu: *See—*
Iwase, Kazuo; Kawai, Hisasi; Yoshimura, Kunimasa; Ito, Toshimitsu; and Ito, Yoshiyasu, 4,356,551, Cl. 364-431.080.
Ito, Yoshiyasu: *See—*
Iwase, Kazuo; Kawai, Hisasi; Yoshimura, Kunimasa; Ito, Toshimitsu; and Ito, Yoshiyasu, 4,356,551, Cl. 364-431.080.
Itoh, Minoru; and Sasaki, Toshio, to Brother Kogyo Kabushiki Kaisha. Needle threaders for a sewing machine. 4,355,591, Cl. 112-225.000.
ITT Industries, Inc.: *See—*
Miskin, Leslie, 4,356,410, Cl. 307-265.000.
Ullrich, Manfred F., 4,356,407, Cl. 307-221.00D.
Iwamatsu, Masayuki, to Nippon Gakki Seizo Kabushiki Kaisha. Class A push-pull amplifier with bias controlling circuit. 4,356,452, Cl. 330-265.000.
Iwao, Junichi; Oya, Masayuki; Baba, Toshio; Iso, Tadashi; and Chiba, Takehisa, to Santen Pharmaceutical Co., Ltd. Antihypertensive 4-thiazolidinecarboxylic acids (pyridyl derivatives). 4,356,183, Cl. 424-263.000.
Iwasaki, Shinichiro, to Aisin Seiki Company Limited. Motor speed control system. 4,356,438, Cl. 318-344.000.
Iwase, Kazuo; Kawai, Hisasi; Yoshimura, Kunimasa; Ito, Toshimitsu; and Ito, Yoshiyasu, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Knock detecting method. 4,356,551, Cl. 364-431.080.
Iwatschenko, Peter; and Hirschmann, Josef, to Hirschmann, Josef. Infusion apparatus. 4,355,638, Cl. 128-214.00F.
J. B. Foote Foundry Co., The: *See—*
Reinhard, Anton J.; and Hauser, Hans, 4,355,549, Cl. 74-850.000.
J.I. Case Company: *See—*
Frisbee, Claude M., 4,355,819, Cl. 280-752.000.
J. M. Huber Corporation: *See—*
Abercrombie, William F., Jr.; Colwell, Joey G., Jr.; and Price, Charles R., 4,356,093, Cl. 210-695.000.
J. M. Voith GmbH: *See—*
Fischer, Siegbert; and Pfalzer, Lothar, 4,356,058, Cl. 162-5.000.
Schon, Werner; and Meinecke, Albrecht, 4,356,085, Cl. 209-273.000.
J. T. Baker Chemicals B.V.: *See—*
Verbeek, Antonie E.; and Mattheij, Jozef M. J., 4,355,998, Cl. 23-230.00R.
Jackovitz, John F.; Seidel, Joseph; and Pantier, Earl A., to Westinghouse Electric Corp. Iron active electrode and method of making same. 4,356,101, Cl. 252-182.100.
Jackson, Brian: *See—*
Cram, Leonard A.; Jackson, Brian; and Gilday, Montague R., 4,356,488, Cl. 343-7.0PF.
Jacobsen, Frederick W.: *See—*
Bridgnell, David G.; and Jacobsen, Frederick W., 4,355,780, Cl. 248-675.000.
Jain, Pawan K.: *See—*
Carron, Mark S.; La Barbera, Ronald S.; Van Brocklin, Lester P.; and Jain, Pawan K., 4,356,130, Cl. 260-989.000.
James, Christopher, to Herbert, Arthur Sydney. Hang glider flight simulator. 4,355,982, Cl. 434-30.000.
James, Kenneth A.: *See—*
Quick, William H.; James, Kenneth A.; and Strahan, Virgil H., 4,355,910, Cl. 374-162.000.
Japan EP Rubber Co., Ltd.: *See—*
Makino, Kenya; Sakurai, Hieo; Watanabe, Masaru; and Nishimura, Toshiyuki, 4,356,160, Cl. 423-492.000.

Jennings, Harold J.; and Lugowski, Czeslaw, to Canadian Patents & Development Ltd. Immunogenic polysaccharide-protein conjugates. 4,356,170, Cl. 424-92.000.

Jensen, Thomas C.; Stevens, Phillip E.; and Landry, Henry J., Jr., to Deere & Company. Stack folding outrigger system. 4,355,690, Cl. 172-311.000.

Jernigan, Doyle D.; and Caskey, Margaret, to Golf Division, Wood-Arts Company, Inc. Weighted, inlaid golf iron and method of making same. 4,355,808, Cl. 273-169.000.

Jessop, Harvey A.; and Funk, Albert G., to IRECO Chemicals. Emulsion explosives containing high concentrations of calcium nitrate. 4,356,044, Cl. 149-2.000.

JGC Corporation: *See*—
Kagawa, Naohiko; Yamamoto, Katsumi; Sasano, Rin; Kusakabe, Takao; and Moriya, Yasuhiro, 4,356,148, Cl. 422-9.000.

Jobst Institute, Inc.: *See*—
Sandman, Terry L., 4,355,632, Cl. 128-24.00R.

Johansson, Francis J.; and Christenson, Thomas. Wallet theft guard. 4,355,440, Cl. 24-3.00H.

Johansson, Inge J. G.; and Reinhall, Rolf B., to Defibrator Aktiebolag. Device in grinding apparatus. 4,355,767, Cl. 241-244.000.

Johansson, Johan G. I., to Defibrator Aktiebolag. Rotary grinding disc for defibrating apparatus. 4,355,768, Cl. 241-261.300.

John Wyeth & Brother Limited: *See*—
Cavalla, John F., 4,356,185, Cl. 424-270.000.

Johnson, Jay M., to Yellow Springs Instrument Company, Inc., The. Substrate specific galactose oxidase enzyme electrodes. 4,356,074, Cl. 204-195.00P.

Johnson, Robert C. Hygienic dispenser. 4,355,640, Cl. 128-227.000.

Johnson, Robert G.; and Hendrickson, Thomas E., to Honeywell Inc. Humidity sensor with electrical rejection of contaminants. 4,356,150, Cl. 422-98.000.

Jones, Bradley N.; and Sanford, Lawrence H., to Procter & Gamble Company, The. Panty with a built-in elastic system to minimize gathering and provide a comfortable, conforming fit and method to assemble a panty. 4,355,425, Cl. 2-402.000.

Jones, Charles V. Thermodynamic motor and pulley system. 4,355,516, Cl. 60-675.000.

Jones, Dedger. Wave energy conversion. 4,355,511, Cl. 60-507.000.

Jones, Marshall G.: *See*—
Komanduri, Ranga; Lee, Minyoung; Flom, Donald G.; Thompson, Robert A.; Jones, Marshall G.; and Douglas, Robert J., 4,356,376, Cl. 219-121.0LN.

Jones, Peter J. V.: *See*—
Norval, Stephen V.; and Jones, Peter J. V., 4,356,159, Cl. 423-481.000.

Jordan, James L.: *See*—
Williams, David W.; Jordan, James L.; and Huntsinger, James E., 4,356,208, Cl. 426-592.000.

Josephson, Louis, to American Hardware & Paint Co., Inc. Pivoted blade damper and pin. 4,355,567, Cl. 98-121.00A.

Josephy, Karl; and Baggarley, Richard R., to Avery International Corporation. Process for producing lines of weakness in the protective backing of an adhesive laminate. 4,356,375, Cl. 219-121.0LH.

Joslyn, John. Mechanical carousel top. 4,355,481, Cl. 46-68.000.

Joy Manufacturing Company: *See*—
Moldenhauer, David W., 4,356,367, Cl. 200-298.000.

Judenich, Vsevolod V.: *See*—
Kapitanov, Nikolai N.; Petrova, Natalya P.; Judenich, Vsevolod V.; Kharchenko, Vladimir P.; Smirnov, Boris A.; Ippolitov, Vladimir V.; and Lankina, Nadezhda M., 4,355,751, Cl. 227-19.000.

Junkau, Raymond L. Vertical and horizontal clamp for T-slot. 4,355,793, Cl. 269-93.000.

Jung Products, Inc.: *See*—
Bihl, Claudia J.; and Molloy, Michael C., 4,355,635, Cl. 128-94.000.

Just, Melitta: *See*—
Schonafinger, Karl; Beyerle, Rudi; Mogilev, Anton; Bohn, Helmut; Just, Melitta; Martorana, Piero A.; and Nitz, Rolf-Eberhard, 4,356,178, Cl. 424-248.540.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
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Kabushiki Kaisha Maruyama Seisakusho: *See*—
Shimizu, Yoichi, 4,355,667, Cl. 139-91.000.

Kabushiki Kaisha Morita Seisakusho: *See*—
Mitani, Haruyasu; and Mushimoto, Eiko, 4,355,645, Cl. 128-777.000.
Ota, Sadayasu; and Uchiya, Takeo, 4,355,977, Cl. 433-131.000.

Kabushiki Kaisha Suwa Seikosha: *See*—
Kogure, Shigeru; Momosaki, Eishi; and Inoue, Minoru, 4,356,425, Cl. 310-370.000.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
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Kabushiki Kaisha Ueno Seiyako Oyo Kenkyujo: *See*—
Ueno, Ryuzo; Matsuda, Toshio; Kanayama, Tatsuo; Tomiyasu, Kunihiko; Fujita, Yatsuka; and Nagata, Kiyoshi, 4,356,203, Cl. 426-266.000.

KACA Corporation: *See*—
Ulsky, Carl M., 4,355,556, Cl. 83-124.000.

Kadowaki, Koju; Sarumaru, Kohei; and Tanaka, Yoshiaki, to Mitsubishi Petrochemical Company Limited. Process for producing composite oxide catalysts. 4,356,114, Cl. 252-467.000.

Kagawa, Naohiko; Yamamoto, Katsumi; Sasano, Rin; Kusakabe, Takao; and Moriya, Yasuhiro, to JGC Corporation. Method for preventing corrosion and hydrogen embrittlement of tantalum-made equipment handling hot concentrated sulphuric acid therein. 4,356,148, Cl. 422-9.000.

Kahl, Horst: *See*—
Hertell, Siegfried; Kirchherr, Claus; Kahl, Horst; and Hoffmann, Siegfried, 4,355,655, Cl. 137-117.000.

Kahn, Marvin L.; and O'Mahony, John S., to Rich Products Corporation. Fruit juices having a depressed freezing point. 4,356,195, Cl. 426-51.000.

Kaji, Shigeru; and Noguchi, Seiji, to Pentel Kabushiki Kaisha. Ball-point pen tip. 4,355,915, Cl. 401-216.000.

Kaji, Shoichi, to Kitazawa Valve Co., Ltd. Valve driving apparatus. 4,355,566, Cl. 92-13.600.

Kajigaya, Shinichi: *See*—
Fukuda, Yuji; and Kajigaya, Shinichi, 4,355,792, Cl. 267-153.000.

Kalaus, Gyorgy: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Dancsi, Lajos; Keve, Tibor; and Drexler, Ferenc, 4,356,305, Cl. 546-51.000.

Kaliardos, Nicolas. Anti-corrosion coating for metals. 4,356,036, Cl. 106-1.120.

Kallok, Michael J.; and Doring, John D., to Medtronic, Inc. Transvenous defibrillating lead. 4,355,646, Cl. 128-786.000.

Kalmanash, Michael H., to United Technologies Corporation. Random color switch for beam penetration CRT. 4,356,435, Cl. 315-375.000.

Kaloi, Cyril M., to United States of America, Navy. Multi-band single-feed microstrip antenna system. 4,356,492, Cl. 343-700.0MS.

Kamasako, Shoji: *See*—
Yoshimura, Norihiko; Niiho, Masaaki; Kamasako, Shoji; and Ishiai, Hideyuki, 4,356,513, Cl. 358-213.000.

Kamihama, Kiyoshi: *See*—
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Kanayama, Tatsuo: *See*—
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Kanemitsu, Yutaka; Hagio, Takehiko; Furukawa, Mitsuhiko; Miyahara, Michito; Hara, Yoshimichi; and Kitahira, Takashi, to Nippon Tungsten Co., Ltd. Sintered bodies Al_2O_3-TiC-TiO_2 continuing yttrium (y). 4,356,272, Cl. 501-87.000.

Kanno, Eiichi: *See*—
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Kansai Electric Power, Ltd.: *See*—
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Kanter, Spencer I., to Kanter, Spencer I. Locator device for external cardiac compression during cardiopulmonary resuscitation. 4,355,634, Cl. 128-28.000.

Kao, Charles T. Electric cigarette lighter. 4,356,380, Cl. 219-262.000.

Kao, Mark C. C.: *See*—
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Kapitanov, Nikolai N.; Petrova, Natalya P.; Judenich, Vsevolod V.; Kharchenko, Vladimir P.; Smirnov, Boris A.; Ippolitov, Vladimir V.; and Lankina, Nadezhda M. Surgical instrument for suturing cutaneous tissue. 4,355,751, Cl. 227-19.000.

Karru, Esa; Salmi, Pekka; Paasonen, Hannu; and Helin, Aimo, to Oy Tampella AB. Hydraulic drilling apparatus. 4,355,691, Cl. 173-106.000.

Kasper, Dennis L., to President and Fellows of Harvard College. Method of making a polysaccharide vaccine. 4,356,263, Cl. 435-101.000.

Katagi, Takashi; Urasaki, Shuji; Ebisui, Takashi; and Aoki, Katsuhiko, to Mitsubishi Denki Kabushiki Kaisha. Dual reflector antenna. 4,356,494, Cl. 343-781.0CA.

Katagiri, Kazuharu: *See*—
Ishikawa, Shozo; Katagiri, Kazuharu; Watanabe, Katsunori; Ohta, Shigeto; and Kitahara, Makoto, 4,356,243, Cl. 430-58.000.

Katayama, Nobuaki: *See*—
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Kato, Katsunori: *See*—
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Kato, Toshikazu: *See*—
Saitou, Sinichi; Kato, Toshikazu; Kimura, Kenji; Satoh, Ken; Shibata, Tsutomu; Watanabe, Seizo; and Ohshima, Ken, 4,355,750, Cl. 226-188.000.

Katoh Electrical Machinery Co. Ltd.: *See*—
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Katzman, James A.; Bartlett, Joel F.; Bixler, Richard M.; Davidow, William H.; Despotakis, John A.; Graziano, Peter J.; Green, Michael D.; Greig, David A.; Hayashi, Steven J.; Mackie, David R.; McEvoy, Dennis L.; Treybig, James G.; and Wierenga, Steven W., to Tandem Computers Incorporated. Multiprocessor system. 4,356,550, Cl. 364-200.000.

Kauffman, Robert N.: *See*—
Smith, James D. B.; and Kauffman, Robert N., 4,356,417, Cl. 310-43.000.

Kavesh, Sheldon; Prevorsek, Dusan C.; and Wang, Donald G., to Allied Corporation. Production of high strength polyethylene filaments. 4,356,138, Cl. 264-164.000.

Kawaguchi, Fumikazu: *See*—
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Kawaguchi, Keiji: *See*—
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Kawai, Hisasi: *See*—
Iwase, Kazuo; Kawai, Hisasi; Yoshimura, Kunimasa; Ito, Toshimitsu; and Ito, Yoshiyasu, 4,356,551, Cl. 364-431.080.
Kawamoto, Kinji: *See*—
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Kawamoto, Kiyoaki: *See*—
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Kawasaki Steel Corporation: *See*—
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Kawasaki, Teruo: *See*—
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Kawata, Tadashi: *See*—
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Kawaziri, Kazuhiro: *See*—
Tabei, Masatoshi; Takeda, Keiji; Kawaziri, Kazuhiro; and Higashi, Akio, 4,356,246, Cl. 430-136.000.
Kaye, Wilbur I., to Beckman Instruments, Inc. Near-simultaneous measurements at forward and back scatter angles in light scattering photometers. 4,355,897, Cl. 356-338.000.
Kayss, Manfred. Sack-filling machine. 4,355,741, Cl. 222-415.000.
Kebschull, Franz: *See*—
Feist, Wieland; and Kebschull, Franz, 4,355,901, Cl. 356-373.000.
Keiper U.S.A., Inc.: *See*—
Kluting, Bernd A.; and Zaveri, Vikram H., 4,355,846, Cl. 297-366.000.
Kelchner, Jay R., to Hilliard Corp., The. Rotary plug valve. 4,355,659, Cl. 137-625.190.
Kelkenberg, Heike; and Wolf, Elmar, to Chemische Werke Huls Aktiengesellschaft. Cyclic imides, their preparation and use. 4,356,307, Cl. 546-200.000.
Kelly, Lawrence A., to Sandoz, Inc. Liposome drug delivery systems. 4,356,167, Cl. 424-38.000.
Kemeny, George A.; and Barber, John P., to Westinghouse Electric Corp. Projectile launching system with assured current division. 4,355,561, Cl. 89-8.000.
Kemp, John E. G., to Pfizer Inc. 6-Perhaloalkylsulfonyloxy-penicillanic acids and derivatives thereof. 4,356,122, Cl. 260-245.20R.
Kenton, Joseph R., to Phillips Petroleum Company. Liquid fertilizer solution containing zinc. 4,356,021, Cl. 71-30.000.
Kenyon, Lewis W.: *See*—
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Keramati, Bahram; Bray, Steven C.; and Wood, Ralph T., to General Electric Company. Drip coffeemaker having a condenser eliminating delivery of steam to the water spreader. 4,356,382, Cl. 219-297.000.
Keran, Vitie P.: *See*—
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Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
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Ketterer, Stanley J., to Singer Company, The. Variable bobbin thread control for lockstitch looptaker. 4,355,590, Cl. 112-184.000.
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Kidde, Inc. (Presto Lock Company Division): *See*—
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Kiencke, Uwe: *See*—
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Kienle, Helmut; Schmid, Gerhard E.; Steiner, Werner; and Trippel, Gerhard, to International Business Machines Corporation. Process for fabricating a multi-layer magnetic thin film disk. 4,356,066, Cl. 204-38.00A.
Kim, Sunj-Wan: *See*—
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Kiml, Jiri: *See*—
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Kimura, Akitaka: *See*—
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Kimura, Kenji: *See*—
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Kimura, Naobumi: *See*—
Ogita, Minoru; and Kimura, Naobumi, 4,356,568, Cl. 455-212.000.
Kimura, Yoshimasa: *See*—
Honda, Haruhisa; Toyono, Tsutomu; Nakamura, Shunji; Tanaka, Kano; and Kimura, Yoshimasa, 4,355,884, Cl. 355-14.0CH.
Kimzey, Paul W.; and Super, Daniel J., to Tennant Company. Surface maintenance equipment. 4,355,435, Cl. 15-347.000.
Kincaid, William C. Fireplace boiler with air tight front and controlled draft. 4,355,625, Cl. 126-132.000.
King, Dennis M.: *See*—
Parks, John H.; Alstrin, Charles E.; and King, Dennis M., 4,355,610, Cl. 123-386.000.
King, Edward E.: *See*—
Heavin, Leonard J.; King, Edward E.; and Milliron, Dennis L., 4,356,078, Cl. 208-8.0LE.
Kinoshita, Koichi: *See*—
Hosono, Nagao; Kinoshita, Koichi; and Takahashi, Toru, 4,356,245, Cl. 430-122.000.
Kirchherr, Claus: *See*—
Hertell, Siegfried; Kirchherr, Claus; Kahl, Horst; and Hoffmann, Siegfried, 4,355,655, Cl. 137-117.000.
Kirkland, David D.: *See*—
Gedaly, Jerrell M.; Sadowski, Joseph P.; Kirkland, David D.; and Sigmund, Frank J., 4,356,042, Cl. 148-1.500.
Kisovec, Adrian V., to Boeing Company, The. Wind turbine rotor speed control system. 4,355,955, Cl. 416-23.000.
Kitagawa, Kouichirou; and Kanno, Eiichi, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Pressure responsive safety valve for gas burner. 4,355,970, Cl. 431-77.000.
Kitagawa, Naoto; Masaki, Kunihiko; and Watanabe, Hiroyuki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Steering assembly supporting device of a motor vehicle. 4,355,820, Cl. 280-779.000.
Kitahara, Makoto: *See*—
Ishikawa, Shozo; Katagiri, Kazuharu; Watanabe, Katsunori; Ohta, Shigeto; and Kitahara, Makoto, 4,356,243, Cl. 430-58.000.
Kitahira, Takashi: *See*—
Kanemitsu, Yutaka; Hagio, Takehiko; Furukawa, Mitsuhiko; Miyahara, Michito; Hara, Yoshimichi; and Kitahira, Takashi, 4,356,272, Cl. 501-87.000.
Kitai, Kiyoshi; Nakagawa, Tadashi; and Ishida, Hiroaki, to Seiko Koki Kabushiki Kaisha. Camera equipped with electronic shutter having automatic focus detecting device. 4,355,872, Cl. 354-25.000.
Kitajima, Masao; Arai, Fuminori; and Kondo, Asaji, to Fuji Photo Film Co., Ltd. Multi-layer chemical analytical materials. 4,356,149, Cl. 422-56.000.
Kitamura, Nobuaki: *See*—
Masuda, Kouji; Mizukami, Masao; and Kitamura, Nobuaki, 4,356,409, Cl. 307-264.000.
Kitanaka, Minoru: *See*—
Kobayashi, Hirokazu; and Kitanaka, Minoru, 4,356,228, Cl. 428-283.000.
Kitazawa Valve Co., Ltd.: *See*—
Kaji, Shoichi, 4,355,566, Cl. 92-13.600.
Kittelson, David B.: *See*—
Liu, Benjamin Y. H.; Kittelson, David B.; Dolan, Daniel F.; and Pui, David Y. H., 4,355,504, Cl. 60-275.000.
Kiuchi, Mitsuyuki; Mizukawa, Takumi; Kominami, Hideyuki; and Hattori, Kenji, to Matsushita Electric Industrial Company, Limited. Small load detection by comparison between input and output parameters of an induction heat cooking apparatus. 4,356,371, Cl. 219-10.770.
Klaus, Helmuth; Lause, Heinz; and Brunn, Hansjoachim, to Intertractor Viehmann GmbH & Co., Firma. Track roller for track-laying vehicles. 4,355,988, Cl. 474-91.000.
Kleemann, Axel; Nygren, Robert; and Wagner, Rudolf. Process for the production of 1-amino-propanediol-(2,3) (I). 4,356,323, Cl. 564-475.000.
Kleemann, Axel: *See*—
Bergstein, Wolfgang; Kleemann, Axel; and Martens, Jurgen, 4,356,324, Cl. 568-17.000.
Klein, Gerald B. Method of forming a can end having a vented gate within a push-down aperture. 4,355,935, Cl. 413-17.000.
Kleinschmidt, Peter: *See*—
Reinehr, Ulrich; Hoffmann, Peter; and Kleinschmidt, Peter, 4,356,134, Cl. 264-49.000.
Klement, Ekkehard: *See*—
Ruell, Hartwig; and Klement, Ekkehard, 4,356,396, Cl. 250-227.000.
Kliman, Gerald B.: *See*—
Norton, James F.; Kliman, Gerald B.; and Tompkins, Russell E., 4,356,377, Cl. 219-121.0EH.
Kline, Richard B., II: *See*—
Neumann, Leopold; Kline, Richard B., II; and Scholz, Wolfgang, 4,356,475, Cl. 340-521.000.
Klingberg, Peter: *See*—
Franzen, Rudolf; and Klingberg, Peter, 4,356,008, Cl. 55-112.000.
Klose, Peter H.; and Ovshinsky, Herbert C., to Energy Conversion Devices, Inc. Microfiche recording system. 4,355,890, Cl. 355-54.000.
Kluting, Bernd A.; and Zaveri, Vikram H., to Keiper U.S.A., Inc. Seat back adjuster. 4,355,846, Cl. 297-366.000.

Knappe, Ortwin; and Hame, Walter. Incoming and outgoing air conveyance for dry storage with self heating radioactive materials. 4,356,146, Cl. 376-272.000.

Knepper, J. Irvine; and Sallee, Dennis C., to Petrolite Corporation. Anti-static compositions. 4,356,002, Cl. 44-62.000.

Knifton, John F., to Texaco Inc. Process for preparing propylene glycol monoalkyl ethers and alkoxyacetones. 4,356,327, Cl. 568-387.000.

Knifton, John F., to Texaco Inc. Process for preparing ethylene glycol. 4,356,332, Cl. 568-852.000.

Knott, Jack E., II; Koschak, Matthew S.; and Adams, John P., to American Can Company. Package for food products. 4,355,721, Cl. 206-524.200.

Knudsen, Hans B., to F. L. Smidth & Co. Temperature measurement by means of heat tubes. 4,355,909, Cl. 374-135.000.

Kobayashi, Hirokazu; and Kitanaka, Minoru, to Toray Industries, Inc. Fiber-reinforced moldable sheet and process for preparation thereof. 4,356,228, Cl. 428-283.000.

Kobayashi, Hisao: *See*—
Kono, Hiroya; Hasegawa, Jun; Inagaki, Mitsukane; and Kobayashi, Hisao, 4,355,959, Cl. 417-223.000.

Kobayashi, Kazuho: *See*—
Noguchi, Mikio; and Kobayashi, Kazuho, 4,356,427, Cl. 313-422.000.

Kobayashi, Masami: *See*—
Tamura, Sakae; Yoshida, Hiromi; Kotoh, Takehiko; and Kobayashi, Masami, 4,356,049, Cl. 156-220.000.

Kobayashi, Morimasa; and Sakurai, Nobuo, to Amada Company, Limited. Bandsaw blade deviation detecting apparatus for horizontal bandsaw machines. 4,355,555, Cl. 83-62.100.

Kobayashi, Toshio, to Director of National Food Research Institute, Ministry of Agriculture, Forestry and Fisheries. Process for the separation of solute in cryohydrate and apparatus therefor. 4,355,520, Cl. 62-123.000.

Kobayashi, Yasuyuki; Nezu, Hisao; and Nishikata, Etsushi, to Nippon Seiki Kabushiki Kaisha. Odometer. 4,356,388, Cl. 235-96.000.

Kobayashi, Yoshiro; Kumadaki, Itsumaro; Takahashi, Masaaki; and Yamauchi, Takashi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Aryl- or aralkylbenzene having two benzene rings at least one of which is substituted by at least one 3,3,3-trifluoropropyl group. 4,356,335, Cl. 570-129.000.

Kobe Steel, Limited: *See*—
Sugiyama, Takeshi; Shirouchi, Shoji; Onoda, Mamoru; Kawaguchi, Fumikazu; and Fujita, Isao, 4,356,027, Cl. 75-0.50R.

Kobori, Toshio: *See*—
Yamazaki, Keiji; and Kobori, Toshio, 4,355,875, Cl. 354-38.000.

Koch, Karl-Friedrich: *See*—
Diefendahl, Wolfgang; and Koch, Karl-Friedrich, 4,355,431, Cl. 14-27.000.

Kock, Konrad, to AMP Incorporated. Optical fibre termination. 4,355,862, Cl. 350-96.200.

Koda, Toshihide: *See*—
Tanaka, Hideharu; Ishijima, Koji; and Koda, Toshihide, 4,355,963, Cl. 418-63.000.

Kodama, Yutaka, to Ricoh Co., Ltd. Ink-jet recording device. 4,356,499, Cl. 346-75.000.

Koeberle, Jean: *See*—
Pacheco, Henri; Descours-Saint-Martino, Marie-Ange; Yavordios, Demetre; and Koeberle, Jean, 4,356,188, Cl. 424-317.000.

Koehnecke, Heinrich: *See*—
Boschulte, Rainer; Koehnecke, Heinrich; and Muecke, Siegfried, 4,356,485, Cl. 340-825.170.

Koenig, Garland C. Parachute inflation assistance device. 4,355,774, Cl. 244-145.000.

Kofod, Hans, to Nordisk Insulinlaboratorium. Therapeutically active polypeptides or acid addition salts and a process for producing such compounds. 4,356,119, Cl. 260-112.50R.

Kogawa, Kouichi; Kawasaki, Teruo; Nomura, Hiroyuki; and Yano, Hiroshi, to Nissan Motor Co., Ltd. Multifunction electronic meter for vehicle. 4,356,470, Cl. 340-52.00F.

Koguchi, Kenji, to Xerox Corporation. Transmitter for facsimile. 4,356,516, Cl. 358-288.000.

Kogure, Shigeru; Momosaki, Eishi; and Inoue, Minoru, to Kabushiki Kaisha Suwa Seikosha. Electrode for tuning fork type quartz crystal vibrator. 4,356,425, Cl. 310-370.000.

Kojima, Tamotsu: *See*—
Usui, Tugumoto; Kato, Katsunori; and Kojima, Tamotsu, 4,356,258, Cl. 430-557.000.

Kojima, Teruo: *See*—
Aotani, Yoshimasa; Kojima, Teruo; and Nakakita, Eiji, 4,356,247, Cl. 430-195.000.

Kolb, Eugen: *See*—
Ziegler, Hermann; and Kolb, Eugen, 4,355,845, Cl. 296-210.000.

Kolleas, Pete D. Chain saw bar attachment. 4,355,551, Cl. 76-78.00R.

Komaki, Takao; Matsumoto, Seiji; and Ishida, Masamitsu, to Fuji Photo Film Co., Ltd. Method of processing radiographic image. 4,356,398, Cl. 250-327.200.

Komanduri, Ranga; Lee, Minyoung; Flom, Donald G.; Thompson, Robert A.; Jones, Marshall G.; and Douglas, Robert J., to General Electric Company. Pulse laser pretreated machining. 4,356,376, Cl. 219-121.0LN.

Kominami, Hideyuki: *See*—
Kiuchi, Mitsuyuki; Mizukawa, Takumi; Kominami, Hideyuki; and Hattori, Kenji, 4,356,371, Cl. 219-10.770.

Komori Printing Machinery Co., Ltd.: *See*—
Sugiyama, Hiroyuki, 4,355,800, Cl. 271-229.000.

Kondo, Asaji: *See*—
Kitajima, Masao; Arai, Fuminori; and Kondo, Asaji, 4,356,149, Cl. 422-56.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Tarumi, Noriyoshi; Kawamoto, Kiyoaki; Ueno, Kenji; and Sakaguchi, Hirofumi, 4,355,881, Cl. 355-3.0FU.
Usui, Tugumoto; Kato, Katsunori; and Kojima, Tamotsu, 4,356,258, Cl. 430-557.000.

Kono, Hiroya; Hasegawa, Jun; Inagaki, Mitsukane; and Kobayashi, Hisao, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Rotation sensor of a swash-plate type compressor. 4,355,959, Cl. 417-223.000.

Kopel, Jeffrey L., to Sprague Electric Company. Terminated monolithic ceramic chip capacitor. 4,356,529, Cl. 361-304.000.

Koppelmann, Eldo K.; and Blackmun, Wayne E., to Santrade Ltd. Indexable spade drill blade. 4,355,932, Cl. 408-188.000.

Kornrumpf, William P.; and Ciccone, Joseph L., to General Electric Company. Method and circuit for controlling a hybrid contactor. 4,356,525, Cl. 361-4.000.

Kortikov, Viktor S.: *See*—
Belyakov, Viktor P.; Bronshtein, Alexandr S.; and Kortikov, Viktor S., 4,356,132, Cl. 261-114.0TC.

Korzelius, Donald G., to Quaker Oats Company, The. Switch mechanism. 4,355,483, Cl. 46-232.000.

Kosa, Yasunobu, to Hitachi, Ltd. Method of fabricating a mis-type device by using a gate electrode and selectively implanted nitride layer. 4,356,041, Cl. 148-1.500.

Koschak, Matthew S.: *See*—
Knott, Jack E., II; Koschak, Matthew S.; and Adams, John P., 4,355,721, Cl. 206-524.200.

Koshugi, Junichi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Spherically shaped material comprising acylated product of de-N-acetylated chitin. 4,356,236, Cl. 428-403.000.

Kostermeier, Karl-Heinz. Cutter for wood chippers. 4,355,673, Cl. 144-230.000.

Kostka, Miroslav: *See*—
Schroder, Joris; Bosshard, Hans; Kiml, Jiri; Kostka, Miroslav; and Zimmermann, Walter, 4,355,705, Cl. 187-29.00R.

Kotoh, Takehiko: *See*—
Tamura, Sakae; Yoshida, Hiromi; Kotoh, Takehiko; and Kobayashi, Masami, 4,356,049, Cl. 156-220.000.

Kough, John K.: *See*—
Martin, Otis M.; and Kough, John K., 4,355,491, Cl. 52-540.000.

Kountz, Kenneth J.; and Norbeck, Dean K., to Borg-Warner Corporation. Adjustable surge and capacity control system. 4,355,948, Cl. 415-1.000.

Kourimsky, Friedrich J. A., to AMP Incorporated. Electrical junction box. 4,355,853, Cl. 339-17.0LM.

Kraft, Derald H., to Dyneer Corporation. Arrangement for tensioning the drive belt for vehicle accessories. 4,355,991, Cl. 474-110.000.

Kraftwerk Union Aktiengesellschaft: *See*—
Boer, Joachim; and Beermann, Heinrich, 4,356,419, Cl. 310-217.000.
Krauss, Peter; Muller, Ewald; Porner, Horst; and Weber, Robert, 4,355,790, Cl. 266-252.000.
Reifenberg, Rolf, 4,355,514, Cl. 60-660.000.

Krapcho, John, to E. R. Squibb & Sons, Inc. Mercaptoacyl derivatives of 4-disubstituted prolines. 4,356,182, Cl. 424-263.000.

Kraskin, Kenneth S., to Personal Products Company. Inhibiting production of undesirable products on body surfaces and environs employing aminopolycarboxylic compounds. 4,356,190, Cl. 424-319.000.

Krauss, Peter; Muller, Ewald; Porner, Horst; and Weber, Robert, to Kraftwerk Union Aktiengesellschaft. Heat-treatment device for prolonging the life of a pressure vessel such as a reactor pressure vessel especially. 4,355,790, Cl. 266-252.000.

Kring, Helmut: *See*—
Cloos, Erwin; Schmidt, Manfred; Kring, Helmut; Schnell, Gerhard; and Thielmann, Joachim, 4,356,378, Cl. 219-124.100.

Krob, Erwin; and Weigl, Erwin, to TMC Corporation. Ski brake. 4,355,817, Cl. 280-605.000.

Kruder, George A., to HPM Corporation. Extrusion method with short cycle multichannel wave screw. 4,356,140, Cl. 264-176.00R.

Krueger, Gordon P.: *See*—
Lund, Anders E.; and Krueger, Gordon P., 4,355,754, Cl. 238-83.000.

Krumm, Paul J.: *See*—
Laughlin, Donald; and Krumm, Paul J., 4,355,643, Cl. 128-663.000.

Kubota, Hitoshi; Takahashi, Toshiyuki; and Hayashida, Yoshihiro, to Nissan Motor Company, Ltd. Reservoir for use with tandem master cylinder. 4,355,512, Cl. 60-534.000.

Kubota Ltd.: *See*—
Hirooka, Masami; and Harada, Denzaburo, 4,355,693, Cl. 180-6.480.

Kuettner, Klaus E., to Rush-Presbyterian-St. Luke's Medical Center. Anti-invasion factor containing cultures. 4,356,261, Cl. 435-68.000.

Kuhle, Engelbert: *See*—
Dickore', Karlfried; and Kuhle, Engelbert, 4,356,024, Cl. 71-93.000.

Kuki, Takakuni, to Nippon Electric Co., Ltd. Source voltage drop detecting circuit. 4,356,481, Cl. 340-636.000.

Kumadaki, Itsumaro: *See*—
Kobayashi, Yoshiro; Kumadaki, Itsumaro; Takahashi, Masaaki; and Yamauchi, Takashi, 4,356,335, Cl. 570-129.000.

Kumagai, Yugo, to Hitachi Chemical Co., Ltd. Thermosetting resin composition. 4,356,285, Cl. 525-111.000.

Kumakawa, Shiro; and Kuroda, Toshimasa, to Teijin Limited. Thermoplastic synthetic filaments and process for producing the same. 4,356,234, Cl. 428-372.000.

Kuperman, Gilbert G.; and Hann, Reuben L., to United States of America, Air Force. Color moving target simulation apparatus. 4,355,981, Cl. 434-14.000.

Kuraray Co., Ltd.: *See*—
Nakao, Makoto; Nakao, Toshiko; Nagai, Fumiko; Dogen, Masako; and Tabata, Yoshitomi, 4,356,172, Cl. 424-101.000.
Yoshimura, Noriaki; and Tamura, Masuhiko, 4,356,333, Cl. 568-840.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Kobayashi, Yoshiro; Kumadaki, Itsumaro; Takahashi, Masaaki; and Yamauchi, Takashi, 4,356,335, Cl. 570-129.000.
Koshugi, Junichi, 4,356,236, Cl. 428-403.000.

Kuroda, Toshimasa: *See*—
Kumakawa, Shiro; and Kuroda, Toshimasa, 4,356,234, Cl. 428-372.000.

Kurokawa, Mikio: *See*—
Uno, Hitoshi; Kurokawa, Mikio; and Nakamura, Hideo, 4,356,186, Cl. 424-275.000.

Kurose, Morisumi: *See*—
Ejiri, Koichi; Kurose, Morisumi; and Hayakawa, Seiji, 4,356,555, Cl. 364-515.000.

Kusakabe, Takao: *See*—
Kagawa, Naohiko; Yamamoto, Katsumi; Sasano, Rin; Kusakabe, Takao; and Moriya, Yasuhiro, 4,356,148, Cl. 422-9.000.

Kuschel, Frank: *See*—
Schubert, Herrmann; Pelzl, Gerhard; Zaschke, Horst; Demus, Dietrich; Nothni, Hans-Ulrich; and Kuschel, Frank, 4,356,103, Cl. 252-299.100.

Kutnyak, Thomas A.; Desai, Mahendra N.; and Berman, Roy A., to Automation Industries, Inc. Thermoplastic compositions containing polyvinylidene fluoride and chlorinated polyethylene. 4,356,284, Cl. 524-520.000.

La Barbera, Ronald S.: *See*—
Carron, Mark S.; La Barbera, Ronald S.; Van Brocklin, Lester P.; and Jain, Pawan K., 4,356,130, Cl. 260-989.000.

La Bate, Micheal D. Hot metal runner system with air pollution controls. 4,355,788, Cl. 266-157.000.

Ladin, Eli M., to Federal-Mogul Corporation. Rotatable machine assembly. 4,355,992, Cl. 474-152.000.

Laga, Gerry T.: *See*—
Harnagel, Gary L.; Laga, Gerry T.; Harrison, Joseph M.; and Twaddell, Victor A., 4,355,456, Cl. 29-572.000.

Lagoutte, Serge; and Franchet, Alain G., to Pont-A-Mousson S.A. Apparatus for producing hollow plastic bottles by thermal heating and blow mold expansion. 4,355,968, Cl. 425-526.000.

Lakshmanan, Pallavoor R., to Gulf Oil Corporation. Coated articles bearing a coating of a blend of an ionomer resin and an alkenyl succinic anhydride. 4,356,238, Cl. 428-461.000.

Lalancette, Jean M.; and Dunnigan, Jacques, to Societe Nationale de l'Amiante. Phosphated asbestos fibers. 4,356,057, Cl. 162-3.000.

Lalk, James W.; and Hamburg, Frances P., to Dow Chemical Company, The. N-Alkylated 2-(2-pyridyl)imidazoles useful as metallurgical extractants. 4,356,309, Cl. 546-278.000.

Lama, William L.: *See*—
Cole, David L.; Swistak, Gregory B.; Ryon, Randall C.; Lama, William L.; and Northrup, Karl A., 4,355,891, Cl. 355-57.000.

Lampic, Milan: *See*—
Orths, Kurt; Lampic, Milan; Berger, Peter; Muller, Jorg; and Loblich, Herbert, 4,355,907, Cl. 374-26.000.

Landa, Benzion, to Savin Corporation. Photocopier scanning apparatus. 4,355,883, Cl. 355-8.000.

Landry, Henry J., Jr.: *See*—
Jensen, Thomas C.; Stevens, Phillip E.; and Landry, Henry J., Jr., 4,355,690, Cl. 172-311.000.

Lane, Leland O.: *See*—
Ringrose, James R.; and Dahle, Leonard G. (said James R. Ringrose assors. to), 4,355,956, Cl. 416-132.00B.

Lange, Roger W.; and Szecsy, Alek P., to Minnesota Mining and Manufacturing Company. Primed inorganic substrates overcoated with curable protective compositions. 4,356,233, Cl. 428-336.000.

Lankina, Nadezhda M.: *See*—
Kapitanov, Nikolai N.; Petrova, Natalya P.; Judenich, Vsevolod V.; Kharchenko, Vladimir P.; Smirnov, Boris A.; Ippolitov, Vladimir V.; and Lankina, Nadezhda M., 4,355,751, Cl. 227-19.000.

Lansen, Jacqueline: *See*—
Demarne, Henri; Bernhart, Claude; and Lansen, Jacqueline, 4,356,177, Cl. 424-248.540.

Laporte Industries Limited: *See*—
Dyer, Alan, 4,355,637, Cl. 128-206.190.
Dyer, Alan; and Araya, Abraham, 4,356,156, Cl. 423-328.000.

Largman, Theodore, to Allied Corporation. Phosphine suppressants for polymeric compositions including red phosphorus as a flame retardant. 4,356,282, Cl. 524-398.000.

La Rochelle, John H.: *See*—
Nielsen, Robert P.; and La Rochelle, John H., 4,356,312, Cl. 549-534.000.

Larson, Robert L. Closure and seal for sheathed multi-strand cable ends. 4,356,343, Cl. 174-74.00A.

Laue, Eric G.: *See*—
United States of America, National Aeronautics and Space Administration; and Laue, Eric G., 4,355,896, Cl. 356-222.000.

Laughlin, Donald; and Krumm, Paul J., to University of Iowa Research Foundation. Vacuum cup doppler flow transducer and method for using same. 4,355,643, Cl. 128-663.000.

Lause, Heinz: *See*—
Klaus, Helmuth; Lause, Heinz; and Brunn, Hansjoachim, 4,355,988, Cl. 474-91.000.

Lavado, Neal M.: *See*—
Levesque, Paul N.; and Lavado, Neal M., 4,355,654, Cl. 137-110.000.

Lavallee, Pierre A.; Marshall, Sidney W.; and Antos, Ronald L., to Xerox Corporation. Double pass scanning system. 4,355,860, Cl. 350-6.800.

Lavery, John J., to Champion International Corporation. Carton with window and hanging panel and carton blank therefor. 4,355,758, Cl. 229-39.00R.

Lawless, William N. Thallous and cesium halide materials for use in cryogenic applications. 4,356,235, Cl. 428-379.000.

Leavitt, Richard I., to Mobil Oil Corporation. Water-soluble polymers and utilization thereof. 4,356,095, Cl. 252-8.55D.

Lee, Eui-Wan, to ASQ Boats, Inc. Wafer boat. 4,355,974, Cl. 432-253.000.

Lee, Kenneth S. Movable glazing and insulation for windows. 4,355,676, Cl. 160-107.000.

Lee, Minyoung: *See*—
Komanduri, Ranga; Lee, Minyoung; Flom, Donald G.; Thompson, Robert A.; Jones, Marshall G.; and Douglas, Robert J., 4,356,376, Cl. 219-121.0LN.

Lee, Ross A., to Du Pont de Nemours, E. I., and Company. Photosensitive negative-working tonable element. 4,356,252, Cl. 430-270.000.

Lee, Yue G. L.; and Dudgeon, Charles D., to General Electric Company. In-situ formation of a diprimary amine curing agent. 4,356,297, Cl. 528-44.000.

Lefebvre, Paul R.: *See*—
Carroll, James C.; and Lefebvre, Paul R., 4,355,731, Cl. 217-26.500.

Lehman, Clarence M. Hand truck construction. 4,355,941, Cl. 414-490.000.

Lehmann, Dieter; Femmer, Klaus; and Faust, Gottfried, to Veb Arzneimittelwerk Dresden. Phenoxyalkanolamine derivatives. 4,356,322, Cl. 564-185.000.

Leicht, Frederick M., to Cameron Iron Works, Inc. Mudline suspension system. 4,355,825, Cl. 285-3.000.

Leichter, Louis M.; Sonnonstine, Terry J.; Stofko, John J., Jr.; and Beretta, Paolo, to Minnesota Mining and Manufacturing Company. Quinoxaline cyanine dye sensitized organic electron donor compounds. 4,356,244, Cl. 430-82.000.

Leigh Interests Limited: *See*—
Chappell, Christopher L., 4,356,000, Cl. 44-1.00D.

Leitner, Kurt: *See*—
Deubzer, Bernward; Egerter, Norbert; Frey, Volker; and Leitner, Kurt, 4,356,293, Cl. 525-477.000.

Leitner, Wolfgang: *See*—
Honig, Helmut; Leitner, Wolfgang; and Pampouchidis, Georg, 4,356,276, Cl. 523-404.000.

Lemaire, Francis R. J.: *See*—
Bavoux, Robert J. A.; Lemaire, Francis R. J.; and Salkazanov, Pierre, 4,356,548, Cl. 364-200.000.

Lemmeyer, Gary R., to Quaker Oats Company, The. Yarn coloring picture set and method of coloring. 4,355,722, Cl. 206-575.000.

Lemoine, Maurice G.; and Pasdera, Leonard A., to Ampex Corporation. High frequency digital PCM decoding apparatus. 4,356,518, Cl. 360-51.000.

Lemon, Wilfred T. Self-feeding wood burning heating unit. 4,355,587, Cl. 110-293.000.

Lenderking, Bruce N.; and Garrett, Donald P., to Westinghouse Electric Corp. Optical valve position sensor system. 4,356,397, Cl. 250-231.05E.

Leonard, Willie B. Pump-motor power limiter and pressure relief. 4,355,506, Cl. 60-389.000.

Lepere, Henri G.; and Walter, Wolfgang, to Georg Fischer Aktiengesellschaft. Multistation blast processing apparatus. 4,355,490, Cl. 51-419.000.

Leskovec, Edward V., to Towmotor Corporation. Article restraining device. 4,355,695, Cl. 180-68.500.

Leu, Beat: *See*—
Mittelmeier, Heinz; Moser, Heinz; and Leu, Beat, 4,355,429, Cl. 3-1.911.

Leuenberger, Roland. Tapping drill. 4,355,931, Cl. 408-123.000.

Leugering, Gunter, heir: *See*—
Weinlich, Jurgen; Plewan, Otto; Leugering, Hans-Joachim, deceased; Leugering nee Wegener, Ursula M., heiress; Leugering, Lothar, heir; Leugering, Manfred, heir; Bahn nee Leugering, Rita, heiress; and Leugering, Gunter, heir, 4,356,283, Cl. 524-504.000.

Leugering, Hans-Joachim, deceased: *See*—
Weinlich, Jurgen; Plewan, Otto; Leugering, Hans-Joachim, deceased; Leugering nee Wegener, Ursula M., heiress; Leugering, Lothar, heir; Leugering, Manfred, heir; Bahn nee Leugering, Rita, heiress; and Leugering, Gunter, heir, 4,356,283, Cl. 524-504.000.

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Weinlich, Jurgen; Plewan, Otto; Leugering, Hans-Joachim, deceased; Leugering nee Wegener, Ursula M., heiress; Leugering, Lothar, heir; Leugering, Manfred, heir; Bahn nee Leugering, Rita, heiress; and Leugering, Gunter, heir, 4,356,283, Cl. 524-504.000.

Leugering, Manfred, heir: *See*—
Weinlich, Jurgen; Plewan, Otto; Leugering, Hans-Joachim, deceased; Leugering nee Wegener, Ursula M., heiress; Leugering, Lothar, heir; Leugering, Manfred, heir; Bahn nee Leugering,

Rita, heiress; and Leugering, Gunter, heir, 4,356,283, Cl. 524-504.000.
Leugering nee Wegener, Ursula M., heiress: *See*—
Weinlich, Jurgen; Plewan, Otto; Leugering, Hans-Joachim, deceased; Leugering nee Wegener, Ursula M., heiress; Leugering, Lothar, heir; Leugering, Manfred, heir; Bahn nee Leugering, Rita, heiress; and Leugering, Gunter, heir, 4,356,283, Cl. 524-504.000.
LeVahn, Bruce A., to Minnesota Scientific, Inc. Surgical retractor apparatus with improved clamping device. 4,355,631, Cl. 128-20.000.
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Devitt, Michael T.; and Ross [illegible]ohn B., 4,356,197, Cl. 426-89.000.
Levesque, Paul N.; and Lavado, [illegible]al M., to Midland-Ross Corporation. Fluid flow control device for monitoring the fluid flow in a conduit for leakage of fluid. 4,355,654, Cl. 137-110.000.
Lewis, J. Stephen: *See*—
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Lewis, Roy D.; and Borg, Bernt V., to Norden Packaging Machinery Aktiebolag. Method and apparatus for handling packaging containers. 4,355,495, Cl. 53-579.000.
Lewis, Sheldon N.; and Haggard, Richard A., to Rohm and Haas Company. Novel polymers of alkyl acrylates. 4,356,288, Cl. 525-308.000.
LGZ Landis & Gyr Zug AG: *See*—
Steinle, Benedikt; Schneider, Gernot; and Nuenlist, Hans, 4,356,553, Cl. 364-483.000.
Licentia Patent Verwaltungs-G.m.b.H.: *See*—
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Morz, Gunter, 4,356,495, Cl. 343-786.000.
Liebert, Karl-Heinz; and Tischer, Werner, to Zahnradfabrik Friedrichshafen, AG. Rotatable controller valve. 4,355,505, Cl. 60-384.000.
Lieder, David G.: *See*—
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Lievonen, Kari J. Pipe connection. 4,355,919, Cl. 403-191.000.
Light, Gerard M., to Eaton Corporation. Viscous fan drive with self-supporting brush holder assembly. 4,355,709, Cl. 192-58.00B.
Lim, John; Brady, Michael; and Novak, Kirk, to Filtrol Corporation. Substrates with calibrated pore size and catalysts employing the same. 4,356,113, Cl. 252-455.00Z.
Linde Aktiengesellschaft: *See*—
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Linde, Gerhard; and Rueckborn, Guenter, to Linde Aktiengesellschaft. Split pressure feed for the selective production of pure oxygen from air. 4,356,013, Cl. 62-13.000.
Linde, Klaus: *See*—
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Lipert, Peter, to Atara Corporation. Circulating device for liquids containing long-chain molecules. 4,356,131, Cl. 261-77.000.
Liu, Benjamin Y. H.; Kittelson, David B.; Dolan, Daniel F.; and Pui, David Y. H., to University of Minnesota, The Regents of the. Apparatus for reducing particles discharged by combustion means. 4,355,504, Cl. 60-275.000.
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Loeber, Fred M. Shipping container with coil spring supports. 4,355,723, Cl. 206-599.000.
Loffelman, Frank F.; and Brady, Thomas E., to American Cyanamid Company. Novel polymeric light stabilizers for polymers. 4,356,287, Cl. 525-204.000.
Lohse, Friedrich: *See*—
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Lokuta, Frederick P.: *See*—
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Longoni, Angelo: *See*—
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Loos, Michel: *See*—
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Lopez, Jose G.; and Gould, Kenneth W., to Wyoming Mineral Corporation. Uranium extraction coefficient control in the process of uranium extraction from phosphoric acid. 4,356,154, Cl. 423-10.000.
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Lotsch, Wolfgang, to BASF Aktiengesellschaft. Sparingly soluble isoinodoline colorants. 4,356,123, Cl. 260-326.00N.
Lovinger, Andrew J.; and Sharpe, Louis H., to Bell Telephone Laboratories, Incorporated. Conductive adhesive system including a conductivity enhancer. 4,356,505, Cl. 357-72.000.
Lovness, William R.: *See*—
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Lowery, John W.: *See*—
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Lowery, Kirby, Jr.: *See*—
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Lowther, Frank E., to Atlantic Richfield Company. Rotary sliding vane device with radial bias control. 4,355,965, Cl. 418-111.000.
Lucas Industries Limited: *See*—
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Seilly, Alec H.; Mowbray, Dorian F.; Mardell, John E.; and Davison, Michael J., 4,355,620, Cl. 123-499.000.
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Luksch, Heinrich E., to Outboard Marine Corporation. Cooling system with removable valve member. 4,355,612, Cl. 123-41.080.
Lumbeck, Peter; and Exner, Hans, to Dynamit Nobel AG. Method of obtaining alkali aluminates from aqueous solutions. 4,356,162, Cl. 423-600.000.
Lummus Company, The: *See*—
Sy, Angel, 4,356,336, Cl. 570-243.000.
Lund, Anders E.; and Krueger, Gordon P., to Michigan Technological University, Board of Control of. Structural members comprised of composite wood material and having zones of diverse density. 4,355,754, Cl. 238-83.000.
Lynch, Kevin L.: *See*—
Ady, Michael S.; Lufkin, Roger F.; and Lynch, Kevin L., 4,355,577, Cl. 102-378.000.
M.A.N. Maschinenfabrik Augsburg Nurnberg Aktiengesellschaft: *See*—
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Maag Gear-Wheel & Machine Co. Ltd.: *See*—
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MacGregor, David C. Porous flexible vascular graft. 4,355,426, Cl. 3-1.400.
Mack, Alfred; O'Neill, Brian C.; and Penzetta, Fred L., to International Business Machines Corporation. Low shock transmissive antechamber seal mechanisms for vacuum chamber type semi-conductor wafer electron beam writing apparatus. 4,355,937, Cl. 414-217.000.
Mackie, David R.: *See*—
Katzman, James A.; Bartlett, Joel F.; Bixler, Richard M.; Davidow, William H.; Despotakis, John A.; Graziano, Peter J.; Green, Michael D.; Greig, David A.; Hayashi, Steven J.; Mackie, David R.; McEvoy, Dennis L.; Treybig, James G.; and Wierenga, Steven W., 4,356,550, Cl. 364-200.000.
Macovski, Albert, to Maxim Diagnostic Imaging. Transparency contrast enhancement system using a planar ultraviolet source. 4,356,399, Cl. 250-461.100.
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Maeda, Masaru, to Nippon Kogaku K. K. Method and apparatus for correcting for meteorological error in distance measurements using light waves. 4,355,894, Cl. 356-5.000.
Magento Tecnica di Cardone Michele & C.S.n.c.: *See*—
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Maitani, Yoshihisa, to Olympus Optical Co., Ltd. Program EE camera. 4,355,874, Cl. 354-31.000.

Makinen, Heimo, to Elevator GmbH. Procedure for fine positioning an alternating current lift. 4,355,704, Cl. 187-29.00R.
Makino, Kenya; Sakurai, Hieo; Watanabe, Masaru; and Nishimura, Toshiyuki, to Japan EP Rubber Co., Ltd. Process for producing titanium trihalides by reducing titanium tetrahalides. 4,356,160, Cl. 423-492.000.
Maloney, Timothy, to One Design, Inc. Environmentally driven heating and cooling system. 4,355,682, Cl. 165-48.00S.
Mandish, Theodore O. Hydroponic tray and method of manufacture. 4,355,484, Cl. 47-58.000.
Mangels, John A., to Ford Motor Company. Method of densifying an article formed of reaction bonded silicon nitride. 4,356,136, Cl. 264-65.000.
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Marcus, Michael A., to Eastman Kodak Company. Pseudo-AC method of nonuniformly poling a body of polymeric piezoelectric material and flexure elements produced thereby. 4,356,424, Cl. 310-357.000.
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Marine Construction & Design Co.: *See*—
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Maruo, Kiyoshi: *See*—
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Marvel, Carl S.; and Sankaran, Venkatesa, to United States of America, Air Force. Polyaromatic ether-ketone-sulfones containing 1,3-butadiene units. 4,356,298, Cl. 528-173.000.
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Shimizu, Norio; Odawara, Yoji; and Masaki, Yasunori, 4,356,268, Cl. 435-253.000.
Masclet, Jean; and Turiot, Andre, to Messier-Hispano-Bugatti (SA). Retractable running gear for vehicle. 4,355,773, Cl. 244-102.00R.
Masologites, George P., to Atlantic Richfield Company. Process for agglomerating coal. 4,355,999, Cl. 44-1.0SR.
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Matthews, Wesley D.; and Matthews, Floyd G. Modular stairway system for installation on structures having non-linear walls. 4,355,700, Cl. 182-83.000.
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McNamara, Harold J.; and Schilk, Joan A., to Shell Oil Company. Process for reducing the total sulfur content of a high CO_2-content feed gas. 4,356,161, Cl. 423-573.00R.

McShane, James L.; Golick, Leonard R.; and Spiegelman, Stanley R., to Westinghouse Electric Corp. Sludge measuring apparatus and ultrasonic probe assembly therefor. 4,355,536, Cl. 73-633.000.

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Mercer, Scott A.: *See*—
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Merck & Co., Inc.: *See*—
Christensen, Burton G.; Ratcliffe, Ronald W.; and Salzmann, Thomas N., 4,356,120, Cl. 260-239.00A.
Cragoe, Edward J., Jr.; Stokker, Gerald E.; and Gould, Norman P., 4,356,313, Cl. 560-53.000.
Cragoe, Edward J., Jr.; Stokker, Gerald E.; and Gould, Norman P., 4,356,314, Cl. 560-53.000.

Mercuzot, Dominique, to CEM Compagnie Electro Mecanique. Brush holder for rotating electrical machines. 4,356,420, Cl. 310-239.000.

Mercz, Jeno: *See*—
Bar, Vilmos; Boszormenyi, Joszef; Richter, Peter; Mercz, Jeno; and Rozsnyai, Tamas, 4,356,306, Cl. 546-176.000.

Mesdan S.p.A.: *See*—
Bertoli, Luciano, 4,355,498, Cl. 57-22.000.

Messier-Hispano-Bugatti (SA): *See*—
Masclet, Jean; and Turiot, Andre, 4,355,773, Cl. 244-102.00R.

Metallwerk Max Brose GmbH & Co.: *See*—
Hess, Peter; Rampel, Hans; and Schulz, Volkmar, 4,355,778, Cl. 248-429.000.

Meyer, Thomas N.: *See*—
Down, Michael G.; Heberlein, Joachim V. R.; and Meyer, Thomas N., 4,356,029, Cl. 75-0.50B.

Meyer zu Riemsloh, Heinz, to Intensity-Filter GmbH & Co. KG. Filter apparatus having filter elements and reverse-flow cleaning means. 4,356,010, Cl. 55-302.000.

Meyers, Kenneth R.: *See*—
Martin, Edward W.; Meyers, Kenneth R.; and Tucker, Fred E., III, 4,355,570, Cl. 99-446.000.

Miano, Jeffrey D.: *See*—
Sandler, Stanley R.; and Miano, Jeffrey D., 4,356,274, Cl. 521-120.000.

Michigan Technological University, Board of Control of: *See*—
Lund, Anders E.; and Krueger, Gordon P., 4,355,754, Cl. 238-83.000.

Micron Kiki Co., Ltd.: *See*—
Ikenoue, Tsuneo; Liu, Shin-yng; Umemoto, Shuichi; and Arai, Naoki, 4,356,541, Cl. 363-20.000.

Midland-Ross Corporation: *See*—
Griffiths, William C., 4,355,683, Cl. 165-60.000.
Levesque, Paul N.; and Lavado, Neal M., 4,355,654, Cl. 137-110.000.

Miles, John H., to Wean United, Inc. Method and apparatus for uncoiling and straightening material for processing thereof. 4,355,526, Cl. 72-164.000.

Miles, Robert A. Rodent barrier device. 4,356,087, Cl. 210-131.000.

Miller, Charlie D., to Carrier Corporation. Method of operating a tube extracting mechanism. 4,355,450, Cl. 29-426.500.

Miller, David D., to Garrett Corporation, The. Life raft inflation system. 4,355,987, Cl. 441-41.000.

Miller, Donald E., to Continental Group, Inc., The. Hold down mechanism. 4,355,527, Cl. 72-351.000.

Miller, Franklyn D.: *See*—
Muller, Werner C.; and Miller, Franklyn D., 4,356,266, Cl. 435-162.000.

Miller, Glen E., to Boeing Company, The. Digital fiber optic sensor system. 4,356,395, Cl. 250-227.000.

Miller, James H. Apparatus for canning food. 4,355,669, Cl. 141-147.000.

Miller, Keith H.: *See*—
Elford, William J.; Williams, Donald E.; and Miller, Keith H., 4,356,045, Cl. 156-64.000.

Miller, Kenneth Y.; and Hutchinson, William R., to Ingersoll-Rand Company. Oil supply system, and method of retrofitting, and method of inhibiting oil foaming in, an oil supply system. 4,356,006, Cl. 55-55.000.

Miller, Victor D., Jr.: *See*—
Brown, David L.; and Miller, Victor D., Jr., 4,355,952, Cl. 415-115.000.

Miller, William H.: *See*—
Burkes, William M., Jr.; and Miller, William H., 4,355,663, Cl. 138-44.000.

Milliron, Dennis L.: *See*—
Heavin, Leonard J.; King, Edward E.; and Milliron, Dennis L., 4,356,078, Cl. 208-8.0LE.

Mineo, Masatoshi: *See*—
Matsumoto, Tadayuki; Imaeda, Kozo; Mineo, Masatoshi; and Nakagawa, Kiyoshi, 4,355,445, Cl. 28-274.000.

Minigrip, Inc.: *See*—
Tilman, Paul A., 4,355,494, Cl. 53-416.000.

Minnesota Mining and Manufacturing Company: *See*—
Dressler, Daryl D., 4,356,480, Cl. 340-620.000.
Heyer, Raymond F.; and Lovness, William R., 4,355,489, Cl. 51-400.000.
Lange, Roger W.; and Szecsy, Alek P., 4,356,233, Cl. 428-336.000.
Leichter, Louis M.; Sonnonstine, Terry J.; Stofko, John J., Jr.; and Beretta, Paolo, 4,356,244, Cl. 430-82.000.
Soch, Fredrich A., 4,356,273, Cl. 521-114.000.

Minnesota Scientific, Inc.: *See*—
LeVahn, Bruce A., 4,355,631, Cl. 128-20.000.

Minolta Camera Kabushiki Kaisha: *See*—
Yamazaki, Keiji; and Kobori, Toshio, 4,355,875, Cl. 354-38.000.

Miskin, Leslie, to ITT Industries, Inc. Pulse transmission and repetition circuit. 4,356,410, Cl. 307-265.000.

Missouri Portland Cement Co.: *See*—
Zans, William A.; and Vander Meulen, Edward F., 4,355,928, Cl. 406-90.000.

Mitani, Haruyasu; and Mushimoto, Eiko, to Kabushiki Kaisha Morita Seisakusho. Device for displaying masticatory muscle activities. 4,355,645, Cl. 128-777.000.

Mitani, Yoshio, to Murata Kikai Kabushiki Kaisha. Truck driving apparatus. 4,355,581, Cl. 104-166.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Katagi, Takashi; Urasaki, Shuji; Ebisui, Takashi; and Aoki, Katsuhiko, 4,356,494, Cl. 343-781.0CA.
Ozaki, Minoru; Onishi, Ken; and Tanaka, Kunimaro, 4,356,517, Cl. 360-13.000.
Tanaka, Hideharu; Ishijima, Koji; and Koda, Toshihide, 4,355,963, Cl. 418-63.000.

Mitsubishi Kasei Kogyo Kabushiki Kaisha: *See*—
Furuya, Hiroshi; Okada, Munehisa; Takemura, Eiichiro; and Sato, Hideyo, 4,355,756, Cl. 229-4.500.

Mitsubishi Petrochemical Company Limited: *See*—
Fujii, Masaki; and Goto, Shiro, 4,356,295, Cl. 526-125.000.
Kadowaki, Koju; Sarumaru, Kohei; and Tanaka, Yoshiaki, 4,356,114, Cl. 252-467.000.

Mittelmeier, Heinz; Moser, Heinz; and Leu, Beat, to Osteo AG. Slide prosthesis for the knee joint. 4,355,429, Cl. 3-1.911.

Mitutoyo Mfg. Co., Ltd.: *See*—
Mizuno, Ichiro; and Nakahara, Masao, 4,355,468, Cl. 33-147.00F.

Miura, Shuzi; Yoshida, Tsunemasa; Ono, Shoji; Masuho, Yasuhiko; and Sawada, Shuzo, to Teijin Limited. IgM Derivatives and process for the preparation thereof. 4,356,173, Cl. 424-101.000.

Miwa, Kishio: *See*—
Inoue, Takehisa; and Miwa, Kishio, 4,356,331, Cl. 568-758.000.

Miyahara, Michito: *See*—
Kanemitsu, Yutaka; Hagio, Takehiko; Furukawa, Mitsuhiko; Miyahara, Michito; Hara, Yoshimichi; and Kitahira, Takashi, 4,356,272, Cl. 501-87.000.

Mizukami, Masao: *See*—
Masuda, Kouji; Mizukami, Masao; and Kitamura, Nobuaki, 4,356,409, Cl. 307-264.000.

Mizukawa, Takumi: *See*—
Kiuchi, Mitsuyuki; Mizukawa, Takumi; Kominami, Hideyuki; and Hattori, Kenji, 4,356,371, Cl. 219-10.770.

Mizuno, Ichiro; and Nakahara, Masao, to Mitutoyo Mfg. Co., Ltd. Micrometer. 4,355,468, Cl. 33-147.00F.

Mobil Oil Corporation: *See*—
Desaau, Ralph M., 4,356,079, Cl. 208-10.000.
Gross, Benjamin, 4,356,082, Cl. 208-164.000.
Leavitt, Richard I., 4,356,095, Cl. 252-8.55D.
Schatz, Klaus W., 4,355,539, Cl. 73-863.110.
Young, Lewis B., 4,356,338, Cl. 585-407.000.

Moench, Jerry D.; and Tesch, Rodney C., to Motorola, Inc. Substrate bias regulator. 4,356,412, Cl. 307-304.000.

Mogilev, Anton: *See*—
Schonafinger, Karl; Beyerle, Rudi; Mogilev, Anton; Bohn, Helmut; Just, Melitta; Martorana, Piero A.; and Nitz, Rolf-Eberhard, 4,356,178, Cl. 424-248.540.

Mohat, William D., to Babcock & Wilcox Company, The. Masterless power supply arrangement. 4,356,403, Cl. 307-60.000.

Mohiuddin, Gulam: *See*—
Emanuel, Peter R.; Salman, Syed; and Mohiuddin, Gulam, 4,356,230, Cl. 428-290.000.

Moldenhauer, David W., to Joy Manufacturing Company. Electric switch. 4,356,367, Cl. 200-298.000.

Moll, Hans, to M.A.N. Maschinenfabrik Augsburg Nurnberg Aktiengesellschaft. Axle suspension for the driven axle of a road vehicle. 4,355,696, Cl. 180-73.0TL.

Molloy, Michael C.: *See*—
Bihl, Claudia J.; and Molloy, Michael C., 4,355,635, Cl. 128-94.000.

Moloney, Kieron J.; and Thomas, Gerald S., to Lucas Industries Limited. Reciprocable plunger fuel injection pump. 4,355,546, Cl. 74-569.000.

Molt, Kenneth R., to Carstab Corporation. 2,2,6,6-Tetramethyl-4-piperidyl-substituted heterocyclic ring compound and polymers containing same. 4,356,279, Cl. 524-102.000.

Momosaki, Eishi: *See*—
Kogure, Shigeru; Momosaki, Eishi; and Inoue, Minoru, 4,356,425, Cl. 310-370.000.

Monsanto Company: *See*—
Coleman, James P.; Hallcher, Richard C.; and McMackins, Dudley E., 4,356,317, Cl. 560-241.000.
Robach, Michael C., 4,356,204, Cl. 426-321.000.

Montana Billiard Supply: *See*—
Sargent, Alfred E., 4,355,802, Cl. 273-11.00R.

Montedison S.p.A.: *See*—
Bettarini, Franco; Massardo, Pietro; Piccardi, Paolo; and Longoni, Angelo, 4,356,329, Cl. 568-637.000.
Roffia, Paolo; Calini, Pierangelo; and Tonti, Sergio, 4,356,319, Cl. 562-414.000.

Montier, Michel, to Societe pour L'Etude et la Fabrication de Circuits Integres Speciaux EFCIS. Process and device for monitoring the plasma etching of thin layer utilizing pressure changes in the plasma. 4,356,055, Cl. 156-626.000.

Moodie, Eldon E.; and Burns, Richard D., to General Electric Company. Apparatus for making connection insulators. 4,356,051, Cl. 156-459.000.

Moore, Leo M. Scraper and sensor apparatus. 4,355,734, Cl. 222-63.000.

Moraw, Roland; and Schadlich, Renate, to Hoechst Aktiengesellschaft. Method and apparatus for selective lamination of thermoplastic layers. 4,356,052, Cl. 156-498.000.

Morimoto, Izumi; and Sakamoto, Isao, to Nippon Electric Co., Ltd. Engine generator power supply system. 4,356,402, Cl. 307-19.000.

Morimoto, Masahiro: *See*—
Imai, Hajime; Morimoto, Masahiro; and Fujiwara, Takao, 4,356,210, Cl. 427-38.000.

Morin, Marius J., to Cutter Laboratories, Inc. Flow control device. 4,355,783, Cl. 251-9.000.

Morisawa, Tahei, to Asahi Kogaku Kogyo Kabushiki Kaisha. Mechanism for counting film frames in camera with multiple exposure mode. 4,355,877, Cl. 354-217.000.

Morishita, Hitoshi; Bada, Hajime; and Sudo, Fumio, to Kawasaki Steel Corporation. Method of dephosphorizing molten pig iron. 4,356,032, Cl. 75-52.000.

Morishita, Yasomatsu, to Ryobi, Ltd. Reel mounting handle. 4,355,480, Cl. 43-22.000.

Moriya, Yasuhiro: *See*—
Kagawa, Naohiko; Yamamoto, Katsumi; Sasano, Rin; Kusakabe, Takao; and Moriya, Yasuhiro, 4,356,148, Cl. 422-9.000.

Moriyama, Masakazu: *See*—
Hayashi, Kunihisa; and Moriyama, Masakazu, 4,355,614, Cl. 123-436.000.

Morz, Gunter, to Licentia Patent-Verwaltungs-GmbH. Corrugated antenna feedhorn with elliptical aperture. 4,356,495, Cl. 343-786.000.

Moser, Heinz: *See*—
Mittelmeier, Heinz; Moser, Heinz; and Leu, Beat, 4,355,429, Cl. 3-1.911.

Mostek Corporation: *See*—
Gedaly, Jerrell M.; Sadowski, Joseph P.; Kirkland, David D.; and Sigmund, Frank J., 4,356,042, Cl. 148-1.500.

Motorola, Inc.: *See*—
Moench, Jerry D.; and Tesch, Rodney C., 4,356,412, Cl. 307-304.000.
Quirey, Tim A.; and D'Amico, Thomas V., 4,356,389, Cl. 235-455.000.

Mott, Richard C.; and Smulkstys, Louis S., to Honeywell Inc. Stepper motor control. 4,356,439, Cl. 318-685.000.

Mount, Bruce E., to Medimetric Company. Telemetering system for operating room and the like. 4,356,486, Cl. 340-870.380.

Mowbray, Dorian F.: *See*—
Seilly, Alec H.; Mowbray, Dorian F.; Mardell, John E.; and Davison, Michael J., 4,355,620, Cl. 123-499.000.

Moy, David, to Halcon SD Group, Inc., The. Process for the preparation of acetaldehyde. 4,356,328, Cl. 568-484.000.

Muccigrosso, Deborah A.: *See*—
Diamond, Steven E.; Mares, Frank; Muccigrosso, Deborah A.; and Solar, Jeffrey P., 4,356,311, Cl. 549-524.000.

Muecke, Siegfried: *See*—
Boschulte, Rainer; Koehnecke, Heinrich; and Muecke, Siegfried, 4,356,485, Cl. 340-825.170.

Muggli, Jurg; and Muller, Peter, to Cerberus AG. Employing a shape memory alloy in a fire alarm temperature sensitive element. 4,356,478, Cl. 340-593.000.

Muldoon, James F., to Electronic Associates, Inc. Gas measurement and analysis system. 4,355,533, Cl. 73-23.100.

Muller, Ewald: *See*—
Krauss, Peter; Muller, Ewald; Porner, Horst; and Weber, Robert, 4,355,790, Cl. 266-252.000.

Muller, George R.: *See*—
Wells, Rodney L.; Rowe, Monty L.; Yates, Samuel L.; and Muller, George R., 4,356,280, Cl. 524-148.000.

Muller, Hanns P.: *See*—
Wagner, Kuno; Dahm, Manfred; and Muller, Hanns P., 4,356,275, Cl. 521-136.000.

Muller, Jorg: *See*—
Orths, Kurt; Lampic, Milan; Berger, Peter; Muller, Jorg; and Loblich, Herbert, 4,355,907, Cl. 374-26.000.

Muller, Klaus; Rieger, Franz; Maurer, Helmut; Linder, Ernst; Reber, Harald; and Dietz, Hermann, to Robert Bosch GmbH. Method and apparatus for obtaining a control variable for the closed-loop control of the fuel-air ratio in the operating mixture of internal combustion engines. 4,355,618, Cl. 123-489.000.

Muller, Peter: *See*—
Muggli, Jurg; and Muller, Peter, 4,356,478, Cl. 340-593.000.

Muller, Werner C.; and Miller, Franklyn D., to National Distillers & Chemical Corp. Process for the hydrolysis of starch and fermentable hydrolysates obtained therefrom. 4,356,266, Cl. 435-162.000.

Mullis, Clyde M.: *See*—
Tosato, Lawrence P.; and Mullis, Clyde M., 4,355,785, Cl. 254-362.000.

Murakami, Tetsuro, to Toyo Kogyo Co., Ltd. Pillar construction for motor vehicle. 4,355,843, Cl. 296-201.000.

Murata Kikai Kabushiki Kaisha: *See*—
Mitani, Yoshio, 4,355,581, Cl. 104-166.000.
Suganuma, Buro; Sekitani, Noboru; Hatanaka, Yasuaki; and Inoue, Yasuhiro, 4,355,770, Cl. 242-35.50A.
Yanobu, Hideo; and Fujiwara, Kazuyuki, 4,355,500, Cl. 57-279.000.

Murofushi, Toshiaki: *See*—
Aoshima, Atsushi; and Murofushi, Toshiaki, 4,356,316, Cl. 560-208.000.

Murphy, Bruce. Apparatus for trimming trees. 4,355,497, Cl. 56-235.000.

Murray, Gary J.: *See*—
Neville, David M., Jr.; Youle, Richard J.; and Murray, Gary J., 4,356,117, Cl. 260-112.00R.

Murray, Stephen B.: *See*—
Coffey, Clayton G.; Murray, Stephen B.; and Bayly, Donald L., 4,355,507, Cl. 60-39.500.

Musgrave, Harry J. Palletized poultry coop handling system. 4,355,939, Cl. 414-413.000.

Mushimoto, Eiko: *See*—
Mitani, Haruyasu; and Mushimoto, Eiko, 4,355,645, Cl. 128-777.000.

Mutschler, Otto. Stand for holding and sealingly retaining India ink drawing implements. 4,355,726, Cl. 211-69.500.

Nagai, Fumiko: *See*—
Nakao, Makoto; Nakao, Toshiko; Nagai, Fumiko; Dogen, Masako; and Tabata, Yoshitomi, 4,356,172, Cl. 424-101.000.

Nagashima, Nao, to Canon Kabushiki Kaisha. Image forming apparatus provided with surface potential control device. 4,355,885, Cl. 355-14.0CH.

Nagata, Kiyoshi: *See*—
Ueno, Ryuzo; Matsuda, Toshio; Kanayama, Tatsuo; Tomiyasu, Kunihiko; Fujita, Yatsuka; and Nagata, Kiyoshi, 4,356,203, Cl. 426-266.000.

Naglieri, Anthony N.; and Rizkalla, Nabil, to Halcon SD Group, Inc., The. Preparation of carboxylic acids. 4,356,320, Cl. 562-517.000.

Nakagawa, Kiyoshi: *See*—
Matsumoto, Tadayuki; Imaeda, Kozo; Mineo, Masatoshi; and Nakagawa, Kiyoshi, 4,355,445, Cl. 28-274.000.

Nakagawa, Tadashi: *See*—
Kitai, Kiyoshi; Nakagawa, Tadashi; and Ishida, Hiroaki, 4,355,872, Cl. 354-25.000.

Nakahara, Masao: *See*—
Mizuno, Ichiro; and Nakahara, Masao, 4,355,468, Cl. 33-147.00F.

Nakajima, Toshihiko: *See*—
Saito, Tadashi; Nakajima, Toshihiko; and Osada, Toshio, 4,356,437, Cl. 318-254.000.

Nakakita, Eiji: *See*—
Aotani, Yoshimasa; Kojima, Teruo; and Nakakita, Eiji, 4,356,247, Cl. 430-195.000.

Nakamichi, Masanari: *See*—
Hatano, Kazunori; Nakamichi, Masanari; and Akiyama, Shun-ichi, 4,356,265, Cl. 435-119.000.

Nakamura, Hideo: *See*—
Uno, Hitoshi; Kurokawa, Mikio; and Nakamura, Hideo, 4,356,186, Cl. 424-275.000.

Nakamura, Nobuyuki: *See*—
Shibanai, Ichiro; Horikoshi, Kouki; and Nakamura, Nobuyuki, 4,356,115, Cl. 252-522.00A.

Nakamura, Shunji: *See*—
Honda, Haruhisa; Toyono, Tsutomu; Nakamura, Shunji; Tanaka, Kano; and Kimura, Yoshimasa, 4,355,884, Cl. 355-14.0CH.

Nakanishi, Yoshiyuki; Akazawa, Yoji; Ikeda, Noriaki; and Suzuki, Takehiko, to Nippon Shukubai Kagaku Kogyo Co. Ltd. Catalyst for production of phthalic anhydride. 4,356,112, Cl. 252-435.000.

Nakao, Makoto; Nakao, Toshiko; Nagai, Fumiko; Dogen, Masako; and Tabata, Yoshitomi, to Kuraray Co., Ltd. Erythrocyte preservative and blood products for long-term storage. 4,356,172, Cl. 424-101.000.

Nakao, Toshiko: *See*—
Nakao, Makoto; Nakao, Toshiko; Nagai, Fumiko; Dogen, Masako; and Tabata, Yoshitomi, 4,356,172, Cl. 424-101.000.
Nakayama, Koichi, to Toko Kabushiki Kaisha. Television sound multiplex signal receiving device. 4,356,510, Cl. 358-143.000.
Nalco Chemical Company: *See*—
Payne, Charles C., 4,356,107, Cl. 252-313.00S.
Nanba, Kenji: *See*—
Doi, Toshitada; Furukawa, Shunsuke; and Nanba, Kenji, 4,356,564, Cl. 371-40.000.
National Distillers & Chemical Corp.: *See*—
Brima, Thomas S., 4,356,310, Cl. 549-295.000.
Muller, Werner C.; and Miller, Franklyn D., 4,356,266, Cl. 435-162.000.
National Hanger Co., Inc.: *See*—
Erthein, Marc, 4,355,743, Cl. 223-96.000.
National Petro Chemicals Corp.: *See*—
Rekers, Louis J.; French, Richard J.; and Mayhew, Harry W., 4,356,294, Cl. 526-100.000.
National Semiconductor Corporation: *See*—
Boettcher, Charles E., 4,355,455, Cl. 29-571.000.
Burns, Carmen D., 4,355,463, Cl. 29-827.000.
Hinds, Sally K.; Weiler, Peter M.; and Hewitt, Robert R., 4,355,719, Cl. 206-334.000.
Naturin-Werk Becker & Co.: *See*—
Winkler, Bruno, 4,356,201, Cl. 426-138.000.
NCR Corporation: *See*—
Bruckner, Ronald L.; Khamare, Ishwar S.; Voyer, Joseph L.; Hamilton, Rodney V.; and Gheorghiu, Paul, 4,356,542, Cl. 363-26.000.
Porter, Warren W., 4,355,856, Cl. 339-95.00R.
Neckermann, Edwin F.; and Wooding, Joseph F. Insulating and filler material comprising cellulose fibers and clay, and method of making same from paper-making waste. 4,356,060, Cl. 162-181.600.
Nelson, Kenneth L.; and FitzGerald, David, to FND Company. Electrically charged, emulsified carrier-fuel particle combustion. 4,355,969, Cl. 431-4.000.
Nelson, Marie A. Shoe horn for handicapped persons. 4,355,745, Cl. 223-118.000.
Nelson, Richard H., to Forward Graphics, Inc. Apparatus and method for resizing artwork. 4,355,889, Cl. 355-39.000.
Nelson, Richard M., to Guy F. Atkinson Company. Flow-adjusted hydraulic rotary machine. 4,355,953, Cl. 415-164.000.
Nessfield, Stanley, to Sea Containers Limited. Folding containers. 4,355,732, Cl. 220-1.500.
Neumann, Leopold; Kline, Richard B., II; and Scholz, Wolfgang, to Siemens Aktiengesellschaft. System containing a predetermined number of monitoring devices and at least one central station. 4,356,475, Cl. 340-521.000.
Neville, David M., Jr.; Youle, Richard J.; and Murray, Gary J., to United States of America, Health & Human Services. Chemical modifications of proteins which induce new receptor specificities and therefore elicit new effects in cells. 4,356,117, Cl. 260-112.00R.
Nevins, James L.; and Padavano, Joseph, to Charles Stark Draper Laboratory, Inc., The. Folded remote center compliance device. 4,355,469, Cl. 33-185.00R.
Nevyas, Herbert J.; and Traub, Alan C., to Diversitronics, Inc. Keratometer. 4,355,871, Cl. 351-13.000.
Newton, Kevin H.: *See*—
Graef, Harry T.; Mercer, Scott A.; Hill, Jeffrey A.; and Newton, Kevin H., 4,355,797, Cl. 271-20.000.
Nezu, Hisao: *See*—
Kobayashi, Yasuyuki; Nezu, Hisao; and Nishikata, Etsushi, 4,356,388, Cl. 235-96.000.
Nicholson, Agnew W. Ladder. 4,355,701, Cl. 182-97.000.
Nicoll, Harry G.: *See*—
Kercheval, John E.; and Nicoll, Harry G., 4,355,519, Cl. 62-6.000.
Nieberger, Melvin: *See*—
Robinson, Charles E.; and Nieberger, Melvin, 4,355,605, Cl. 123-320.000.
Nielsen, Robert P.; and La Rochelle, John H., to Shell Oil Company. Ethylene oxide process. 4,356,312, Cl. 549-534.000.
Nienaber, Heinrich. Gas pedal movement damper. 4,356,471, Cl. 340-52.00R.
Niiho, Masaaki: *See*—
Yoshimura, Norihiko; Niiho, Masaaki; Kamasako, Shoji; and Ishiai, Hideyuki, 4,356,513, Cl. 358-213.000.
Nijhawan, Pramodh; and Duckworth, Joseph M., to Bahnson Company, The. Fumes control system duct and car arrangement. 4,356,064, Cl. 202-263.000.
Niles, Albert B., to Caterpillar Tractor Co. Filtering and dampening apparatus. 4,356,091, Cl. 210-354.000.
Nilsson, Lennart O. E.: *See*—
Dahlberg, Bengt A. G.; Holmberg, Bengt M.; and Nilsson, Lennart O. E., 4,356,383, Cl. 219-308.000.
Nippon Carbon Co., Ltd.: *See*—
Ishikawa, Toshikatsu; Teranishi, Haruo; Yokoyama, Akira; Yanagi, Tetsuo; and Harada, Hirofumi, 4,356,158, Cl. 423-447.400.
Nippon Electric Co., Ltd.: *See*—
Iida, Yasuo; Suzuki, Katumi; and Endo, Nobuhiro, 4,356,223, Cl. 428-156.000.
Kuki, Takakuni, 4,356,481, Cl. 340-636.000.
Morimoto, Izumi; and Sakamoto, Isao, 4,356,402, Cl. 307-19.000.
Oguchi, Tetsuji, 4,356,482, Cl. 340-731.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Iwamatsu, Masayuki, 4,356,452, Cl. 330-265.000.
Ogita, Minoru; and Kimura, Naobumi, 4,356,568, Cl. 455-212.000.
Nippon Kogaku K. K.: *See*—
Maeda, Masaru, 4,355,894, Cl. 356-5.000.
Nippon Oil Company, Limited: *See*—
Imaizumi, Masao; Takezono, Tetsuya; Amari, Takaaki; and Oguchi, Yutaka, 4,356,339, Cl. 585-829.000.
Nippon Seiki Kabushiki Kaisha: *See*—
Kobayashi, Yasuyuki; Nezu, Hisao; and Nishikata, Etsushi, 4,356,388, Cl. 235-96.000.
Nippon Shukubai Kagaku Kogyo Co. Ltd.: *See*—
Nakanishi, Yoshiyuki; Akazawa, Yoji; Ikeda, Noriaki; and Suzuki, Takehiko, 4,356,112, Cl. 252-435.000.
Nippon Soken, Inc.: *See*—
Iwase, Kazuo; Kawai, Hisasi; Yoshimura, Kunimasa; Ito, Toshimitsu; and Ito, Yoshiyasu, 4,356,551, Cl. 364-431.080.
Nippon Tungsten Co., Ltd.: *See*—
Kanemitsu, Yutaka; Hagio, Takehiko; Furukawa, Mitsuhiko; Miyahara, Michito; Hara, Yoshimichi; and Kitahira, Takashi, 4,356,272, Cl. 501-87.000.
Nishikata, Etsushi: *See*—
Kobayashi, Yasuyuki; Nezu, Hisao; and Nishikata, Etsushi, 4,356,388, Cl. 235-96.000.
Nishimura, Toshiyuki: *See*—
Makino, Kenya; Sakurai, Hieo; Watanabe, Masaru; and Nishimura, Toshiyuki, 4,356,160, Cl. 423-492.000.
Nissan Motor Company, Limited: *See*—
Asano, Masaharu; Furuhashi, Shoji; and Tamura, Hideyuki, 4,355,615, Cl. 123-437.000.
Hira, Kazumi, 4,355,842, Cl. 296-199.000.
Hirota, Yukitsugu; Endo, Akira; and Sekine, Kenji, 4,356,489, Cl. 343-7.0VM.
Iizuka, Mitsuru, 4,355,836, Cl. 296-37.900.
Inoue, Mitsumasa, 4,355,622, Cl. 123-548.000.
Kogawa, Kouichi; Kawasaki, Teruo; Nomura, Hiroyuki; and Yano, Hiroshi, 4,356,470, Cl. 340-52.00F.
Kubota, Hitoshi; Takahashi, Toshiyuki; and Hayashida, Yoshihiro, 4,355,512, Cl. 60-534.000.
Ookubo, Takao; Baba, Yuko; and Kamihama, Kiyoshi, 4,355,848, Cl. 301-37.0SS.
Sato, Yoshimi, 4,355,442, Cl. 24-230.0AL.
Shimada, Yukio, 4,355,523, Cl. 62-133.000.
Shimada, Yukio; Suzuki, Naoyoshi; Ohashi, Toshio; and Inoshita, Yasushi, 4,355,681, Cl. 165-16.000.
Shimizu, Kenzo; Fukunaga, Yukio; and Tsuda, Hiroshi, 4,355,837, Cl. 296-37.120.
Tamura, Hideyuki; and Ikeura, Kenji, 4,355,616, Cl. 123-440.000.
Watanabe, Takeaki, 4,355,753, Cl. 237-12.30A.
Yasuhara, Seishi, 4,355,621, Cl. 123-502.000.
Nitz, Rolf-Eberhard: *See*—
Schonafinger, Karl; Beyerle, Rudi; Mogilev, Anton; Bohn, Helmut; Just, Melitta; Martorana, Piero A.; and Nitz, Rolf-Eberhard, 4,356,178, Cl. 424-248.540.
Noguchi, Mikio; and Kobayashi, Kazuho, to Tokyo Shibaura Denki Kabushiki Kaisha. Flat display device. 4,356,427, Cl. 313-422.000.
Noguchi, Seiji: *See*—
Kaji, Shigeru; and Noguchi, Seiji, 4,355,915, Cl. 401-216.000.
Nomichi, Satoru: *See*—
Fukuoka, Tatsuhiko; Ichikawa, Shigeo; and Nomichi, Satoru, 4,355,529, Cl. 73-412.000.
Nomura, Hiroyuki: *See*—
Kogawa, Kouichi; Kawasaki, Teruo; Nomura, Hiroyuki; and Yano, Hiroshi, 4,356,470, Cl. 340-52.00F.
Norbeck, Dean K.: *See*—
Kountz, Kenneth J.; and Norbeck, Dean K., 4,355,948, Cl. 415-1.000.
Norden Packaging Machinery Aktiebolag: *See*—
Lewis, Roy D.; and Borg, Bernt V., 4,355,495, Cl. 53-579.000.
Nordisk Insulinlaboratorium: *See*—
Kofod, Hans, 4,356,119, Cl. 260-112.50R.
Nordson Corporation: *See*—
Rood, Alvin A.; and Hastings, Donald R., 4,355,764, Cl. 239-708.000.
Nordtool AB: *See*—
Hofer, Leo, 4,355,558, Cl. 83-587.000.
Northrup, Karl A.: *See*—
Cole, David L.; Swistak, Gregory B.; Ryon, Randall C.; Lama, William L.; and Northrup, Karl A., 4,355,891, Cl. 355-57.000.
Norton-Berry, Philip: *See*—
Cowen, Geoffrey; Norton-Berry, Philip; and Steel, Margaret L., 4,356,133, Cl. 264-8.000.
Norton, James F.; Kliman, Gerald B.; and Tompkins, Russell E., to General Electric Company. Cutting thin metal sheet with an electron beam. 4,356,377, Cl. 219-121.0EH.
Norton, James R.: *See*—
Herloski, Robert P.; Norton, James R.; and Antos, Ronald L., 4,355,859, Cl. 350-6.100.
Norval, Stephen V.; and Jones, Peter J. V., to Imperial Chemical Industries Limited. Method of recovering bromine from methyl bromide. 4,356,159, Cl. 423-481.000.
Nothni, Hans-Ulrich: *See*—
Schubert, Herrmann; Pelzl, Gerhard; Zaschke, Horst; Demus, Dietrich; Nothni, Hans-Ulrich; and Kuschel, Frank, 4,356,103, Cl. 252-299.100.
Novak, Kirk: *See*—
Lim, John; Brady, Michael; and Novak, Kirk, 4,356,113, Cl. 252-455.00Z.

Novak, Robert L. Abrasion resistant coating. 4,356,037, Cl. 106-209.000.
Nowy, Gunther: *See*—
Wiezer, Hartmut; Nowy, Gunther; and Haberlein, Harald, 4,356,308, Cl. 546-242.000.
Noyori, Masaharu; and Fujimoto, Hiroaki, to Matsushita Electric Industrial Co., Ltd. Electronics circuit device and method of making the same. 4,356,374, Cl. 219-121.0PE.
Nuarc Company, Inc., The: *See*—
Linden, Nicholas O., 4,356,433, Cl. 315-308.000.
Nuenlist, Hans: *See*—
Steinle, Benedikt; Schneider, Gernot; and Nuenlist, Hans, 4,356,553, Cl. 364-483.000.
Nussmeier, Thomas A., to United States of America, Air Force. Interferometric distance measurement method. 4,355,899, Cl. 356-349.000.
Nussmeier, Thomas A., to United States of America, Air Force. Self-calibrating interferometer. 4,355,900, Cl. 356-356.000.
Nuvatec, Inc.: *See*—
Slavik, William H.; Carlson, William P.; and McGowan, Michael J., 4,355,984, Cl. 434-335.000.
N.V. Klippan S.A.: *See*—
Adomeit, Heinz-Dieter, 4,355,772, Cl. 242-107.40A.
Nygren, Robert: *See*—
Kleemann, Axel; Nygren, Robert; and Wagner, Rudolf, 4,356,323, Cl. 564-475.000.
Oberg, Per O., to Sanera Projecting Aktiebolag. Apparatus for recovering oil or the like floating on a liquid surface such as water. 4,356,086, Cl. 210-115.000.
O'Brien, David F.; and Tyminski, Patricia N., to Eastman Kodak Co. Photographic compositions, elements and processes using light-activatable enzymes. 4,356,256, Cl. 430-332.000.
Occidental Research Corporation: *See*—
Che, Stanley C., 4,356,077, Cl. 208-8.00R.
Oda Gosen Kogyo Kabushiki Kaisha: *See*—
Takai, Isao, 4,355,499, Cl. 57-205.000.
O'Dair, James R.: *See*—
Ohrberg, George E.; and O'Dair, James R., 4,355,670, Cl. 144-34.00R.
Odawara, Yoji: *See*—
Shimizu, Norio; Odawara, Yoji; and Masaki, Yasunori, 4,356,092, Cl. 210-611.000.
Shimizu, Norio; Odawara, Yoji; and Masaki, Yasunori, 4,356,268, Cl. 435-253.000.
Oetjen, Georg-Wilhelm; and Benthin, Frank, to Dragerwerk AG. Humdifier and heater for air to be inhaled for connection to an inhalation conduit of a respirator. 4,355,636, Cl. 128-204.130.
Ogemark, Keith F. R.: *See*—
Sallmen, Bengt A. L.; Sjogreen, Carl-Axel E.; Mansson, Mans O.; and Ogemark, Keith F. R., 4,356,110, Cl. 252-407.000.
Ogita, Minoru; and Kimura, Naobumi, to Nippon Gakki Seizo Kabushiki Kaisha. Receptive condition automatic selection device for FM receiver. 4,356,568, Cl. 455-212.000.
Oguchi, Tetsuji, to Nippon Electric Co., Ltd. Image pattern control system. 4,356,482, Cl. 340-731.000.
Oguchi, Yutaka: *See*—
Imaizumi, Masao; Takezono, Tetsuya; Amari, Takaaki; and Oguchi, Yutaka, 4,356,339, Cl. 585-829.000.
Ohashi, Toshio: *See*—
Shimada, Yukio; Suzuki, Naoyoshi; Ohashi, Toshio; and Inoshita, Yasushi, 4,355,681, Cl. 165-16.000.
Ohlsson, Jarl-Erik S. I., to Texogesa S.A. Process of offset printing on sheet material with high viscosity greasy ink. 4,355,576, Cl. 101-426.000.
Ohnishi, Juniti, to Pioneer Electronic Corporation. Linear-tracking pick-up arm drive assembly for audio or video disc player. 4,356,560, Cl. 369-221.000.
Ohniwa, Takehiko; Senuma, Michio; Shimada, Fumio; Saito, Syuichiro; Shigeta, Yoshihiro; and Aizawa, Hiroshi, to Canon Kabushiki Kaisha; and Canon Denshi Kabushiki Kaisha. Magnetic device. 4,355,878, Cl. 354-234.000.
Ohrberg, George E.; and O'Dair, James R., to Crown Zellerbach Corporation. Forestry site preparation system. 4,355,670, Cl. 144-34.00R.
Ohshima, Ken: *See*—
Saitou, Sinichi; Kato, Toshikazu; Kimura, Kenji; Satoh, Ken; Shibata, Tsutomu; Watanabe, Seizo; and Ohshima, Ken, 4,355,750, Cl. 226-188.000.
Ohta, Shigeto: *See*—
Ishikawa, Shozo; Katagiri, Kazuharu; Watanabe, Katsunori; Ohta, Shigeto; and Kitahara, Makoto, 4,356,243, Cl. 430-58.000.
Oil Mop (U.K.) Limited: *See*—
Challener, Ronald T.; and Rolls, George H., 4,356,089, Cl. 210-242.400.
Okada, Munehisa: *See*—
Furuya, Hiroshi; Okada, Munehisa; Takemura, Eiichiro; and Sato, Hideyo, 4,355,756, Cl. 229-4.500.
Okada, Takashi, to Sony Corporation. Brightness adjusting circuit for a cathode ray tube. 4,356,508, Cl. 358-29.000.
Okano, Hiroshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Bearing of a turbomachine. 4,355,850, Cl. 308-9.000.
Okazaki, Hiroshi: *See*—
Sumiyoshi, Hiroji; Suzuki, Mitsumasa; and Okazaki, Hiroshi, 4,356,515, Cl. 358-246.000.
Okubo, Shigeo, to Design Profesionals Financial Corp. Magnetic gyroscope. 4,355,541, Cl. 74-5.60E.
Oliff, James R., to Mead Corporation, The. Wraparound article carrier with adjustable girth. 4,355,717, Cl. 206-140.000.
Olin Corporation: *See*—
Wojtowicz, John A.; and Hooks, Haywood, Jr., 4,356,303, Cl. 544-192.000.
Oliver, Frank C. Desalinization process. 4,356,015, Cl. 62-543.000.
Olympus Optical Co., Ltd.: *See*—
Hattori, Shinichiro, 4,356,534, Cl. 362-32.000.
Maitani, Yoshihisa, 4,355,874, Cl. 354-31.000.
Saitou, Sinichi; Kato, Toshikazu; Kimura, Kenji; Satoh, Ken; Shibata, Tsutomu; Watanabe, Seizo; and Ohshima, Ken, 4,355,750, Cl. 226-188.000.
Watanabe, Seizo, 4,356,524, Cl. 360-129.000.
Yanagida, Tuneo, 4,356,520, Cl. 360-63.000.
O'Mahony, John S.: *See*—
Kahn, Marvin L.; and O'Mahony, John S., 4,356,195, Cl. 426-51.000.
Omron Tateisi Electronics, Co.: *See*—
Agatahama, Shunichi, 4,356,465, Cl. 335-128.000.
One Design, Inc.: *See*—
Maloney, Timothy, 4,355,682, Cl. 165-48.00S.
O'Neill, Brian C.: *See*—
Mack, Alfred; O'Neill, Brian C.; and Penzetta, Fred L., 4,355,937, Cl. 414-217.000.
O'Neill, Michael J.: *See*—
Wykhuis, Lloyd A.; and O'Neill, Michael J., 4,355,946, Cl. 414-707.000.
Onishi, Ken: *See*—
Ozaki, Minoru; Onishi, Ken; and Tanaka, Kunimaro, 4,356,517, Cl. 360-13.000.
Ono, K. Ray, to Bellco Glass Inc. Stirring apparatus for cell culture. 4,355,906, Cl. 366-274.000.
Ono, Shoji: *See*—
Miura, Shuzi; Yoshida, Tsunemasa; Ono, Shoji; Masuho, Yasuhiko; and Sawada, Shuzo, 4,356,173, Cl. 424-101.000.
Ono, Takuo; Fukui, Sigeo; and Ookura, Junichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Apparatus for controlling an inverter main circuit. 4,356,544, Cl. 363-132.000.
Onoda, Mamoru: *See*—
Sugiyama, Takeshi; Shirouchi, Shoji; Onoda, Mamoru; Kawaguchi, Fumikazu; and Fujita, Isao, 4,356,027, Cl. 75-0.50R.
Oohara, Mikio: *See*—
Tajiri, Koji; Oohara, Mikio; and Maruo, Kiyoshi, 4,355,592, Cl. 112-410.000.
Ookubo, Takao; Baba, Yuko; and Kamihama, Kiyoshi, to Nissan Motor Co., Ltd.; and Hashimoto Forming Kogyo Co., Ltd. Wheel cover for a vehicle. 4,355,848, Cl. 301-37.0SS.
Ookura, Junichi: *See*—
Ono, Takuo; Fukui, Sigeo; and Ookura, Junichi, 4,356,544, Cl. 363-132.000.
O'Rear, Jacques G.: *See*—
Griffith, James R.; and O'Rear, Jacques G., 4,356,296, Cl. 526-242.000.
Oriental Yeast Company: *See*—
Saito, Hiraku; Takagahara, Isamu; Suzuki, Yasuo; Fujita, Tuyosi; Fujii, Katsumi; and Horio, Takekazu, 4,356,072, Cl. 204-180.00G.
Orlandea, Nicolae V.; and Wiley, Jack C., to Deere & Company. Vehicular steering and suspension system. 4,355,697, Cl. 180-261.000.
Orloff, Kenneth L.: *See*—
United States of America, National Aeronautics and Space Administration; Orloff, Kenneth L.; and Yanagita, Haruo, 4,355,870, Cl. 350-486.000.
Orths, Kurt; Lampic, Milan; Berger, Peter; Muller, Jorg; and Loblich, Herbert, to Verein zur Forderung der Giesserei-Industrie. Apparatus for picking up a molten test sample of metal or metal alloys and measuring the cooling curve of said sample. 4,355,907, Cl. 374-26.000.
Osada, Toshio: *See*—
Saito, Tadashi; Nakajima, Toshihiko; and Osada, Toshio, 4,356,437, Cl. 318-254.000.
Osika, Thomas F., to McGill Manufacturing Company, Inc. Auxiliary switch assembly for a power contactor. 4,356,368, Cl. 200-307.000.
Osmond, Etienne J. R.: *See*—
Ferrieu, Gilbert M. M.; Osmond, Etienne J. R.; and Hetet, Yves J. F., 4,356,355, Cl. 179-18.0HB.
Osteo AG: *See* —
Mittelmeier, Heinz; Moser, Heinz; and Leu, Beat, 4,355,429, Cl. 3-1.911.
Ostrelich, Michael J., to General Electric Company. Thick film resistor force transducers and weighing scales. 4,355,692, Cl. 177-211.000.
Ota, Akiho: *See*—
Yoshino, Yataro; Ota, Akiho; and Sugiura, Hiroaki, 4,355,728, Cl. 215-1.00C.
Ota, Sadayasu; and Uchiya, Takeo, to Kabushiki Kaisha Morita Seisakusho. Cordless handpiece for dental treatment. 4,355,977, Cl. 433-131.000.
Otis Engineering Corporation: *See*—
Arendt, Henry P.; and Heard, Thomas J., 4,355,686, Cl. 166-313.000.
Otte, Richard F.: *See*—
Cook, Paul M.; Otte, Richard F.; Claypool, James L.; White, Lawrence J.; Broyles, Harry C.; and Brooks, Peter L., 4,355,664, Cl. 138-110.000.
Otto-Simon Carves Limited: *See*—
Corry, David B., 4,356,063, Cl. 201-41.000.

Outboard Marine Corporation: *See*—
Borst, Gaylord M.; and Walsworth, Frank J., 4,355,985, Cl. 440-51.000.
Luksch, Heinrich E., 4,355,612, Cl. 123-41.080.
Stevens, Myron T., 4,355,986, Cl. 440-53.000.
Ovshinsky, Herbert C.: *See*—
Klose, Peter H.; and Ovshinsky, Herbert C., 4,355,890, Cl. 355-54.000.
Owen, William J.; and Booker, Robert A., to Martin Marietta Corporation. Optimum second order digital filter. 4,356,558, Cl. 364-724.000.
Owens-Corning Fiberglas Corporation: *See*—
Reeves, James E., Jr.; Dunn, Michael P.; and Patterson, John L., 4,355,438, Cl. 19-0.510.
Owens, William H., to G. D. Searle & Co. Tryptophan derivatives. 4,356,118, Cl. 260-112.50R.
Oy Tampella AB: *See*—
Karru, Esa; Salmi, Pekka; Paasonen, Hannu; and Helin, Aimo, 4,355,691, Cl. 173-106.000.
Oya, Masayuki: *See*—
Iwao, Junichi; Oya, Masayuki; Baba, Toshio; Iso, Tadashi; and Chiba, Takehisa, 4,356,183, Cl. 424-263.000.
Ozaki, Minoru; Onishi, Ken; and Tanaka, Kunimaro, to Mitsubishi Denki Kabushiki Kaisha. PCM Audio reproducing system. 4,356,517, Cl. 360-13.000.
Ozawa, Akio; Sueyoshi, Susumu; Saito, Keishi; Ishikawa, Kikuo; Yatsuhashi, Kiyomi; Ishii, Satoshi; and Yumino, Masamichi, to Pioneer Electronic Corporation. Amplifier. 4,356,455, Cl. 330-296.000.
Paasonen, Hannu: *See*—
Karru, Esa; Salmi, Pekka; Paasonen, Hannu; and Helin, Aimo, 4,355,691, Cl. 173-106.000.
Pacheco, Henri; Descours-Saint-Martino, Marie-Ange; Yavordios, Demetre; and Koeberle, Jean, to Institut de Recherche Scientifique "I.R.S.". 1-Naphthyl-acetic acid derivatives and their therapeutic applications. 4,356,188, Cl. 424-317.000.
Padavano, Joseph: *See*—
Nevins, James L.; and Padavano, Joseph, 4,355,469, Cl. 33-185.00R.
Page, Jeffrey L. Automatic work piece changer for a milling machine and the like. 4,355,938, Cl. 414-222.000.
Pakhomov, Evgeny P.: *See*—
Asinovsky, Erik I.; Afanasiev, Anatoly A.; and Pakhomov, Evgeny P., 4,356,527, Cl. 361-134.000.
Pako Corporation: *See*—
Willenbring, Armer J., 4,355,748, Cl. 226-67.000.
Pallister, Lawrence R.: *See*—
Denham, Keith; Prickett, Leslie R.; and Pallister, Lawrence R., 4,355,934, Cl. 411-38.000.
Pampouchidis, Georg: *See*—
Honig, Helmut; Leitner, Wolfgang; and Pampouchidis, Georg, 4,356,276, Cl. 523-404.000.
Pan, Sheang Y. Bicycle rear brake mounted with sprocket wheel. 4,355,706, Cl. 188-24.110.
Pantier, Earl A.: *See*—
Jackovitz, John F.; Seidel, Joseph; and Pantier, Earl A., 4,356,101, Cl. 252-182.100.
Papagni, Robert P., to S. A. Automobiles Citroen; and S. A. Automobiles Peugeot. Disc brakes. 4,355,708, Cl. 188-196.00D.
Papay, Andrew G., to Edwin Cooper, Inc. Alkylphosphonate lubricating oil. 4,356,097, Cl. 252-33.400.
Parada, Maya; and Rudolph, Marvin J., to General Foods Corporation. Method of preparing a binder for tableted gasified candy. 4,356,198, Cl. 426-96.000.
Parker, Frank; and Parker, Leslie M. Web granulator with nip rollers having hooking members. 4,355,765, Cl. 241-152.00A.
Parker, Leslie M.: *See*—
Parker, Frank; and Parker, Leslie M., 4,355,765, Cl. 241-152.00A.
Parks, John H.; Alstrin, Charles E.; and King, Dennis M., to Caterpillar Tractor Co. Servo boosted governor control for engines. 4,355,610, Cl. 123-386.000.
Partis, Richard A.: *See*—
Deason, James R.; and Partis, Richard A., 4,356,184, Cl. 424-267.000.
Pasdera, Leonard A.: *See*—
Lemoine, Maurice G.; and Pasdera, Leonard A., 4,356,518, Cl. 360-51.000.
Pathology Products Ltd.: *See*—
Stein, Arthur A.; and Goldman, Max, 4,356,385, Cl. 219-441.000.
Patterson, John L.: *See*—
Reeves, James E., Jr.; Dunn, Michael P.; and Patterson, John L., 4,355,438, Cl. 19-0.510.
Pause, Hans; and Stiller, Walter, to Philipp Holzmann Aktiengesellschaft. Method of protecting the surfaces of concrete structures. 4,355,453, Cl. 29-460.000.
Payling, David W.; and Suschitzky, John L., to Fisons Limited. Antiallergic mono salt of 6-methylamino-4-oxo-10-propyl-4H-pyrano[3,2-g]-quinoline-2,8-dicarboxylic acid. 4,356,181, Cl. 424-258.000.
Payne, Charles C., to Nalco Chemical Company. Process for preparing silica sols. 4,356,107, Cl. 252-313.00S.
Payne, George B.; and Soloway, Samuel B., to Shell Oil Company. Certain herbicidal tetrahydrofurans. 4,356,023, Cl. 71-88.000.
Pearson, Robert E. Means and a method for color separation and for reproduction. 4,355,888, Cl. 355-32.000.
Pelzl, Gerhard: *See*—
Schubert, Herrmann; Pelzl, Gerhard; Zaschke, Horst; Demus, Dietrich; Nothni, Hans-Ulrich; and Kuschel, Frank, 4,356,103, Cl. 252-299.100.
Pennwalt Corporation: *See*—
Berner, Vincent A., 4,355,976, Cl. 433-83.000.
Sandler, Stanley R.; and Miaao, Jeffrey D., 4,356,274, Cl. 521-120.000.
Pentel Kabushiki Kaisha: *See*—
Kaji, Shigeru; and Noguchi, Seiji, 4,355,915, Cl. 401-216.000.
Penzetta, Fred L.: *See*—
Mack, Alfred; O'Neill, Brian C.; and Penzetta, Fred L., 4,355,937, Cl. 414-217.000.
Peppler, William, to Chore-Time Equipment, Inc. Poultry feeder having sequential control. 4,355,596, Cl. 119-18.000.
Perez, Steven R.; Horton, Philip G.; and Wlochowski, Jan M., to Xerox Corporation. Polyvinyl acetal coated carrier particles for magnetic brush cleaning. 4,355,886, Cl. 355-15.000.
Perkins, Lawrence B. Purging device. 4,355,652, Cl. 137-15.000.
Perregaux, Alain; and Bunschi, Toni, to BBC Brown, Boveri & Company, Limited. Transflector designed as a foil for use with liquid crystal displays. 4,355,868, Cl. 350-338.000.
Perry, Thomas J.: *See*—
Comfort, Joseph A.; Perry, Thomas J.; and Loos, Michel, 4,356,404, Cl. 307-115.000.
Personal Products Company: *See*—
Kraskin, Kenneth S., 4,356,190, Cl. 424-319.000.
Perstorp AB: *See*—
Sallmen, Bengt A. L.; Sjogreen, Carl-Axel E.; Mansson, Mans O.; and Ogemark, Keith F. R., 4,356,110, Cl. 252-407.000.
Pesa, Frederick A.; and Graham, Anne M., to Standard Oil Company, The. Process for the production of pyrrolidones. 4,356,124, Cl. 260-326.5FN.
Pesch, Henri-Emile: *See*—
Brandes, Siegfried; Pesch, Henri-Emile; and Gutsch, Uwe, 4,356,145, Cl. 376-265.000.
Peterson, Per V.: *See*—
Hoglund, Hans E.; and Peterson, Per V., 4,356,213, Cl. 427-212.000.
Peterson, Robert V.; Anderson, James M.; Gregonis, Donald E.; Kim, Sunj-Wan; and Feijen, Jan, to University of Utah. Time-release chemical delivery system. 4,356,166, Cl. 424-19.000.
Petrochem Consultants, Inc.: *See*—
Higgins, Robert D., 4,356,014, Cl. 62-28.000.
Petrolite Corporation: *See*—
Knepper, J. Irvine; and Sallee, Dennis C., 4,356,002, Cl. 44-62.000.
Petrova, Natalya P.: *See*—
Kapitanov, Nikolai N.; Petrova, Natalya P.; Judenich, Vsevolod V.; Kharchenko, Vladimir P.; Smirnov, Boris A.; Ippolitov, Vladimir V.; and Lankina, Nadezhda M., 4,355,751, Cl. 227-19.000.
Petteruti, Alfredo. Formaldehyde products as agricultural fungicides. 4,356,179, Cl. 424-249.000.
Pez, Guido P.; and Mador, Irving L., to Allied Corporation. Producing cyclohexene or alkylcyclohexene. 4,356,337, Cl. 585-267.000.
Pfalzer, Lothar: *See*—
Fischer, Siegbert; and Pfalzer, Lothar, 4,356,058, Cl. 162-5.000.
Pfizer Inc.: *See*—
Barth, Wayne E., 4,356,174, Cl. 424-114.000.
Kemp, John E. G., 4,356,122, Cl. 260-245.20R.
Philip Morris, Incorporated: *See*—
Bokelman, Gordon H.; and Gooden, Dewitt J., III, 4,355,648, Cl. 131-290.000.
Gregory, Joseph L., III, 4,355,554, Cl. 83-37.000.
Philipp Holzmann Aktiengesellschaft: *See*—
Pause, Hans; and Stiller, Walter, 4,355,453, Cl. 29-460.000.
Philips, Roxane, Inc.: *See*—
Stagg, Charles M.; and Tribble, Ronald L., 4,356,189, Cl. 424-317.000.
Phillips Petroleum Company: *See*—
Carroll, James C.; and Lefebvre, Paul R., 4,355,731, Cl. 217-26.500.
Kenton, Joseph R., 4,356,021, Cl. 71-30.000.
Wu, Yulin, 4,356,105, Cl. 252-308.000.
Physio-Control Corporation: *See*—
Alferness, Clifton A., 4,355,642, Cl. 128-642.000.
Piccardi, Paolo: *See*—
Bettarini, Franco; Massardo, Pietro; Piccardi, Paolo; and Longoni, Angelo, 4,356,329, Cl. 568-637.000.
Picquendar, Jean E.: *See*—
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Clifford, Jack R., 4,356,039, Cl. 134-8.000.
Pilch, John S., to Ware Machine Service, Inc. Tool mounting apparatus. 4,355,945, Cl. 414-686.000.
Pimenov, Vitalii A.: *See*—
Dolzhenkov, Boris S.; Andreev, Vladimir F.; and Pimenov, Vitalii A., 4,355,789, Cl. 266-207.000.
Pioneer Electronic Corporation: *See*—
Eguchi, Yoichi; and Yokota, Takeshi, 4,356,567, Cl. 455-177.000.
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Ozawa, Akio; Sueyoshi, Susumu; Saito, Keishi; Ishikawa, Kikuo; Yatsuhashi, Kiyomi; Ishii, Satoshi; and Yumino, Masamichi, 4,356,455, Cl. 330-296.000.
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Pipe Line Development Company, The: *See*—
Smith, William B., 4,355,656, Cl. 137-318.000.

Pittsburg & Midway Coal Mining Co., The: *See*—
Heavin, Leonard J.; King, Edward E.; and Milliron, Dennis L., 4,356,078, Cl. 208-8.0LE.

Plessey Overseas Limited: *See*—
Dakin, John P., 4,355,898, Cl. 356-346.000.

Plewan, Otto: *See*—
Weinlich, Jurgen; Plewan, Otto; Leugering, Hans-Joachim, deceased; Leugering nee Wegener, Ursula M., heiress; Leugering, Lothar, heir; Leugering, Manfred, heir; Bahn nee Leugering, Rita, heiress; and Leugering, Gunter, heir, 4,356,283, Cl. 524-504.000.

Plummer, William T., to Polaroid Corporation. Photographic lighting apparatus. 4,356,538, Cl. 362-217.000.

Polaroid Corporation: *See*—
Carcia, Peter P., 4,355,873, Cl. 354-27.000.
Downey, Rogers B., 4,355,462, Cl. 29-791.000.
Gerber, Arthur M., 4,356,257, Cl. 430-496.000.
McCole, Thomas P., 4,356,248, Cl. 430-209.000.
Plummer, William T., 4,356,538, Cl. 362-217.000.

Polizzi, Emanuel V.; and Lieder, David G., to General Electric Company. X-Ray apparatus alignment method and device. 4,356,400, Cl. 378-138.000.

Pollak, Henry M. Self-priming centrifugal pump. 4,355,950, Cl. 415-53.00R.

Poliard, Bernard R. Tower assembly. 4,356,498, Cl. 343-890.000.

Pongrass, Robert G.; and Rutter, Christopher C. Fluid dispenser. 4,355,737, Cl. 222-81.000.

Pont-A-Mousson S.A.: *See*—
Lagoutte, Serge; and Franchet, Alain G., 4,355,968, Cl. 425-526.000.

Poole, Joseph J.; and Strange, Victor E., to BL Cars Limited. Continuously variable ratio transmission. 4,355,547, Cl. 74-690.000.

Porner, Horst: *See*—
Krauss, Peter; Muller, Ewald; Porner, Horst; and Weber, Robert, 4,355,790, Cl. 266-252.000.

Porter, Clifford A.: *See*—
Purcell, Earl T.; and Porter, Clifford A., 4,355,608, Cl. 123-364.000.

Porter, Warren W., to NCR Corporation. Low insertion force connector using non-noble metal contact plating. 4,355,856, Cl. 339-95.00R.

Post, Arnold R. Control knob with rotation limiter. 4,355,544, Cl. 74-526.000.

Pottier, Gilbert: *See*—
Deloison, Victor; and Pottier, Gilbert, 4,355,428, Cl. 3-1.910.

PPG Industries, Inc.: *See*—
Birkmeyer, William J., 4,356,277, Cl. 523-406.000.
Darlington, William B., 4,356,068, Cl. 204-98.000.

Pratt, Paul L.: *See*—
Clifford, Jack R., 4,356,039, Cl. 134-8.000.

Prazak, Gerald: *See*—
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Preher, John L.: *See*—
Herbst, Le Roy J.; and Preher, John L., 4,355,738, Cl. 222-129.000.

Prehodka, Barry V., to Aurora Products Canada Limited. Pivotable ramp device for track games. 4,355,807, Cl. 273-86.00R.

President and Fellows of Harvard College: *See*—
Kasper, Dennis L., 4,356,263, Cl. 435-101.000.

Prevorsek, Dusan C.: *See*—
Kavesh, Sheldon; Prevorsek, Dusan C.; and Wang, Donald G., 4,356,138, Cl. 264-164.000.

Price, Charles R.: *See*—
Abercrombie, William F., Jr.; Colwell, Joey G., Jr.; and Price, Charles R., 4,356,093, Cl. 210-695.000.

Price, James E., to Adver-Togs, Inc. Cap visor and method of manufacture. 4,356,048, Cl. 156-220.000.

Prickett, Leslie R.: *See*—
Denham, Keith; Prickett, Leslie R.; and Pallister, Lawrence R., 4,355,934, Cl. 411-38.000.

Pringle, John K.: *See*—
Sewell, Robert G. S.; Pringle, John K.; Backman, Marvin E.; and Finnegan, Stephen A., 4,355,562, Cl. 89-36.00A.

Procter & Gamble Company, The: *See*—
Jones, Bradley N.; and Sanford, Lawrence H., 4,355,425, Cl. 2-402.000.

PT Components, Inc.: *See*—
Homeier, Ronald F., 4,355,993, Cl. 474-231.000.

Pui, David Y. H.: *See*—
Liu, Benjamin Y. H.; Kittelson, David B.; Dolan, Daniel F.; and Pui, David Y. H., 4,355,504, Cl. 60-275.000.

Pullen, Edward A.; and Hallis, Thomas, Jr., to Union Oil Company of California. Solvent deoiling apparatus and process. 4,356,080, Cl. 208-31.000.

Purcell, Earl T.; and Porter, Clifford A. Surge brake. 4,355,608, Cl. 123-364.000.

Putman, Thomas H.; Gyugyi, Laszlo; and Brennen, Michael B., to Electric Power Research Institute, Inc. Voltage regulator utilizing a static VAR generator with half period averaging and saturating type firing angle control. 4,356,441, Cl. 323-210.000.

Putman, William A.: *See*—
Day, Charles E.; and Putman, William A., 4,356,011, Cl. 55-368.000.

Quaker Oats Company, The: *See*—
Korzelius, Donald G., 4,355,483, Cl. 46-232.000.
Lemmeyer, Gary R., 4,355,722, Cl. 206-575.000.

Quick, William H.; James, Kenneth A.; and Strahan, Virgil H., to Rockwell International Corporation. Method and apparatus for an optical sensor utilizing semiconductor filters. 4,355,910, Cl. 374-162.000.

Quirey, Tim A.; and D'Amico, Thomas V., to Motorola Inc. Bar code scanner interface. 4,356,389, Cl. 235-455.000.

Quiring, Michael S. Punching tool having replaceable tips. 4,355,466, Cl. 30-358.000.

R. F. Smith Corp.: *See*—
Smith, Robert F.; and Walters, Dwight E., 4,355,997, Cl. 23-230.0EP.

Radak, Suzanne E.: *See*—
Chorvat, Robert J.; Desai, Bipinchandra N.; and Radak, Suzanne E., 4,356,302, Cl. 544-34.000.

Rademacher, Paul: *See*—
DiMatteo, Paul; Segnini, Robert; and Rademacher, Paul, 4,355,447, Cl. 29-26.00A.

Radics, Gyula: *See*—
Szendrodi, Valer; Radics, Gyula; Varga, Tivadar; Vass, Tibor; and Gyurics, Karoly, 4,355,840, Cl. 296-179.000.

Rama, Lord, to Coin-Operated Exercise Equipment Co. Inc. Tennis racquet with variable center of gravity and balance. 4,355,803, Cl. 273-73.00J.

Rampel, Hans: *See*—
Hess, Peter; Rampel, Hans; and Schulz, Volkmar, 4,355,778, Cl. 248-429.000.

Ramseier, Paul; and Burkhalter, Hans, to Bracker AG. Heddle. 4,355,665, Cl. 139-96.000.

Raquet, Erwin, to Fried. Krupp Huttenwerke AG. Railway wheels and rails damping structures. 4,355,578, Cl. 104-1.00A.

Ratcliffe, Ronald W.: *See*—
Christensen, Burton G.; Ratcliffe, Ronald W.; and Salzmann, Thomas N., 4,356,120, Cl. 260-239.00A.

Rathjen, Daniel J. Playing field layout. 4,355,813, Cl. 273-411.000.

Rau, David M., III, to CNI Incorporated. Electrical locking mechanism. 4,355,830, Cl. 292-144.000.

Raw, Graham: *See*—
Woodhead, James L.; and Raw, Graham, 4,356,106, Cl. 252-313.00R.

Rayborn, Jerry R.: *See*—
Cowan, Jack C.; Thrash, Tommy; and Rayborn, Jerry R., 4,356,096, Cl. 252-8.50C.

Raychem Corporation: *See*—
Cook, Paul M.; Otte, Richard F.; Claypool, James L.; White, Lawrence J.; Broyles, Harry C.; and Brooks, Peter L., 4,355,664, Cl. 138-110.000.

RCA Corporation: *See*—
Barlett, Salvadore P.; Dougherty, Daniel J.; and Lokuta, Frederick P., 4,355,457, Cl. 29-583.000.
Berkman, Samuel; Duffy, Michael T.; and Temple, Harold E., 4,356,152, Cl. 422-248.000.
Bowman, David F., 4,356,462, Cl. 333-128.000.
Ganssle, Eugene R., 4,355,775, Cl. 244-158.00R.
Sandercock, John R., 4,355,903, Cl. 356-382.000.
Sterzer, Fred, 4,356,415, Cl. 307-522.000.

Realex Corporation: *See*—
Magers, Wallace F., 4,355,962, Cl. 417-552.000.

Reber, Harald: *See*—
Muller, Klaus; Rieger, Franz; Maurer, Helmut; Linder, Ernst; Reber, Harald; and Dietz, Hermann, 4,355,618, Cl. 123-489.000.

Rebikoff, Dimitri. Deep water connector. 4,355,855, Cl. 339-94.00A.

Reed Rock Bit Company: *See*—
Badrak, Robert P., 4,356,034, Cl. 75-203.000.

Reeves, James E., Jr.; Dunn, Michael P.; and Patterson, John L., to Owens-Corning Fiberglas Corporation. Mat forming apparatus. 4,355,438, Cl. 19-0.510.

Regazzoni, Pierre: *See*—
Smith, Robert D.; and Regazzoni, Pierre, 4,356,061, Cl. 376-254.000.

Reifenberg, Rolf, to Kraftwerk Union Aktiengesellschaft. Control device for steam turbines with reheater. 4,355,514, Cl. 60-660.000.

Reinehr, Ulrich; Hoffmann, Peter; and Kleinschmidt, Peter, to Bayer Aktiengesellschaft. Process for the production of hydrophilic fibres and filaments of synthetic polymers. 4,356,134, Cl. 264-49.000.

Reinhall, Rolf B.: *See*—
Johansson, Inge J. G.; and Reinhall, Rolf B., 4,355,767, Cl. 241-244.000.

Reinhard, Anton J.; and Hauser, Hans, to J. B. Foote Foundry Co., The. Safety switch for small transmission. 4,355,549, Cl. 74-850.000.

Reip, Raymond G., to Vapor Corporation. Pilot operated relief valve. 4,355,657, Cl. 137-492.000.

Rekers, Louis J.; French, Richard J.; and Mayhew, Harry W., to National Petro Chemicals Corp. Production of polyolefins having improved ESCR. 4,356,294, Cl. 526-100.000.

Reliable Auto Accessories, Inc.: *See*—
Rosen, Jack S., 4,355,839, Cl. 296-136.000.

Rexnord Inc.: *See*—
Sheldon, Jerome F., 4,355,502, Cl. 59-84.000.

Rey, Georges: *See*—
Cornette, Andre; and Rey, Georges, 4,356,056, Cl. 156-649.000.

Reynolds, William R. Overcurrent-protected inverter. 4,356,543, Cl. 363-56.000.

Rich Products Corporation: *See*—
Kahn, Marvin L.; and O'Mahony, John S., 4,356,195, Cl. 426-51.000.

Richards, Louis R., to Formax, Inc. Method and apparatus for cutting controlled-volume meat portions from a segment of fresh whole-muscle meat. 4,356,205, Cl. 426-518.000.

Richter, Artur. Process for forming charging fuel into agglomerates for the pressure gasification of coal. 4,356,004, Cl. 48-210.000.
Richter Gedeon Vegyeszeti Gyar Rt.: *See—*
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Dancsi, Lajos; Keve, Tibor; and Drexler, Ferenc, 4,356,305, Cl. 546-51.000.
Richter, Peter: *See—*
Bar, Vilmos; Boszormenyi, Joszef; Richter, Peter; Mercz, Jeno; and Rozsnyai, Tamas, 4,356,306, Cl. 546-176.000.
Ricoh Co., Ltd.: *See—*
Ejiri, Koichi; Kurose, Morisumi; and Hayakawa, Seiji, 4,356,555, Cl. 364-515.000.
Funato, Hiroyoshi; and Fukushima, Yoshio, 4,355,858, Cl. 350-3.720.
Kodama, Yutaka, 4,356,499, Cl. 346-75.000.
Rieger, Franz: *See—*
Muller, Klaus; Rieger, Franz; Maurer, Helmut; Linder, Ernst; Reber, Harald; and Dietz, Hermann, 4,355,618, Cl. 123-489.000.
Riggs, Thomas C., to Ingersoll-Rand Company. Controlling means for a fuel valve. 4,355,961, Cl. 417-494.000.
Ringrose, James R.; and Dahle, Leonard G., to Lane, Leland O., by said James R. Ringrose. Wind turbine. 4,355,956, Cl. 416-132.00B.
Ripley Company, Inc.: *See—*
Russo, John G., 4,356,405, Cl. 307-117.000.
Riseman, Jacob, to International Business Machines Corporation. Forming air-dielectric isolation regions in a monocrystalline silicon substrate by differential oxidation of polysilicon. 4,356,211, Cl. 427-85.000.
Rizkalla, Nabil: *See—*
Naglieri, Anthony N.; and Rizkalla, Nabil, 4,356,320, Cl. 562-517.000.
Robach, Michael C., to Monsanto Company. Compound and method for inhibiting growth of spoilage organisms. 4,356,204, Cl. 426-321.000.
Robers, Klaas H. J., to U.S. Philips Corporation. Television keying circuit. 4,356,512, Cl. 358-183.000.
Robert Bosch GmbH: *See—*
Dietz, Hermann, 4,356,065, Cl. 204-1.00T.
Honig, Gunter; Kiencke, Uwe; and Bone, Rainer, 4,356,447, Cl. 324-169.000.
Muller, Klaus; Rieger, Franz; Maurer, Helmut; Linder, Ernst; Reber, Harald; and Dietz, Hermann, 4,355,618, Cl. 123-489.000.
Will, Gerhard; Stroh, Walter; and Zechnall, Martin, 4,355,550, Cl. 74-872.000.
Robertshaw Controls Company: *See—*
Asbill, Clarence M., III, 4,355,983, Cl. 434-219.000.
Robinson, Charles E.; and Nieberger, Melvin, to Robinson, Charles E. Motor brake control method. 4,355,605, Cl. 123-320.000.
Robinson, Morris D. Vehicle gate lift with protection against operation with improper loads. 4,355,943, Cl. 414-557.000.
Robinson, Richard P., to Trod Nossel Recording Studios, Inc. Acoustic image enhancing method and apparatus. 4,356,349, Cl. 179-1.00G.
Roccaforte, Harry I., to Champion International Corporation. Venting carton and blank therefor. 4,355,757, Cl. 229-33.000.
Rockwell International Corporation: *See—*
Cunningham, Vernon R., 4,356,460, Cl. 333-28.00R.
Quick, William H.; James, Kenneth A.; and Strahan, Virgil H., 4,355,910, Cl. 374-162.000.
Yao, Shi-Kay, 4,355,869, Cl. 350-358.000.
Rockwool Aktiebolaget: *See—*
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Rode, Melvin A.; and Toelle, Alvin D., to Bendix Corporation, The. Ignition advance timing system. 4,355,613, Cl. 123-414.000.
Rodibaugh, Scott A.; and Cobb, Delwin E., to Caterpillar Tractor Co. Gear pump having fluid deaeration capability. 4,355,964, Cl. 418-76.000.
Roffia, Paolo; Calini, Pierangelo; and Tonti, Sergio, to Montedison, S.p.A. Method of recovering in active form the catalyst for the terephthalic acid synthesis. 4,356,319, Cl. 562-414.000.
Roger, Raymond, to Automobiles Peugeot; and Automobiles Citroen. Device for detecting defective combustion in an internal combustion engine. 4,355,534, Cl. 73-35.000.
Rogers Corporation: *See—*
Harper, William P.; and Taylor, Michael J., 4,356,366, Cl. 200-159.00B.
Rogier, Edgar, to Henkel Corporation. Fatty polyhydric alcohols having a polar functional group. 4,356,128, Cl. 260-465.600.
Rognoni, Antonio, to Corak Limited. Adjustable support for underwater pipe distant from the sea bed. 4,355,925, Cl. 405-172.000.
Rognoni, Antonio, to Corak Limited. Adjustable support for underwater pipe a short distance from the sea bed. 4,355,926, Cl. 405-172.000.
Rohm and Haas Company: *See—*
Brodnyan, John G.; De Witt, Walter G., III; Gill, Robert A.; and Stelling, Gary D., 4,356,229, Cl. 428-288.000.
Cholod, Michael S.; and Shah, Nipun M., 4,356,299, Cl. 528-279.000.
Gleim, Robert D., 4,356,301, Cl. 528-487.000.
Lewis, Sheldon N.; and Haggard, Richard A., 4,356,288, Cl. 525-308.000.
Rohrer, Gene D.: *See—*
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Rolfe, Keith O. Loading and unloading apparatus for vehicles. 4,355,942, Cl. 414-555.000.
Rolls, George H.: *See—*
Challener, Ronald T.; and Rolls, George H., 4,356,089, Cl. 210-242.400.
Romanauskas, William A., to Du Pont de Nemours, E. I., and Company. Unbalanced rotor for field flow fractionation channel. 4,356,083, Cl. 209-155.000.
Romano, Paul L., to Acoustic Standards. Acoustic strip curtain. 4,355,678, Cl. 160-332.000.
Ronen, Ram S., to Xerox Corporation. Integrated silicon nib for an electrostatic printer. 4,356,501, Cl. 346-155.000.
Ronnow, Peter: *See—*
Thomsen, Ove; and Ronnow, Peter, 4,356,269, Cl. 435-316.000.
Rood, Alvin A.; and Hastings, Donald R., to Nordson Corporation. Low capacitance airless spray apparatus. 4,355,764, Cl. 239-708.000.
Rosa, Umberto: *See—*
Callegaro, Lanfranco; Boniolo, Antonio; Denti, Ennio; Rosa, Umberto; and Rossi, Valdano, 4,356,267, Cl. 435-179.000.
Rosbak, John: *See—*
Hamm, Nicholas; and Rosbak, John, 4,355,688, Cl. 172-4.000.
Rosen, Jack S., to Reliable Auto Accessories, Inc. Theft deterent device for car covers. 4,355,839, Cl. 296-136.000.
Rosenbluth, William; and Williams, Thomas A., to International Business Machines Corporation. MOSFET Convolved logic. 4,356,413, Cl. 307-443.000.
Rosman, Irwin E., to Hi-Shear Corporation. Rivet fastener system. 4,355,531, Cl. 72-479.000.
Ross, Donald H.: *See—*
Schoenkopf, Richard W.; and Ross, Donald H., 4,355,733, Cl. 221-123.000.
Ross, Roger J., to Singer Company, The. Controlled single-operation cam mechanism. 4,355,545, Cl. 74-567.000.
Ross, Sigmund L., to Shuffman, David K. Method and apparatus for controlling water surface activity. 4,356,094, Cl. 210-774.000.
Rossell, John B.: *See—*
Devitt, Michael T.; and Rossell, John B., 4,356,197, Cl. 426-89.000.
Rossi, John P.: *See—*
Goldberg, Abraham A.; and Rossi, John P., 4,356,507, Cl. 358-13.000.
Rossi, Valdano: *See—*
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Rothenberger GmbH & Co.: *See—*
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Rothenberger, Gunter, to Rothenberger GmbH & Co. Device for bending metal pipe. 4,355,528, Cl. 72-388.000.
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Rousseau, Jean-Pierre, to U.S. Philips Corporation. Control device comprising a slidable shaft with a knob. 4,355,921, Cl. 403-316.000.
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Martel, Jacques; Tessier, Jean; and Teche, Andre, 4,356,187, Cl. 424-304.000.
Zalisz, Rene; and Salles, Marie-France, 4,356,171, Cl. 424-92.000.
Rowcliffe, David J.: *See—*
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Rowe, Monty L.: *See—*
Wells, Rodney L.; Rowe, Monty L.; Yates, Samuel L.; and Muller, George R., 4,356,280, Cl. 524-148.000.
Rowland, Bobby A.; Tate, Stanley L.; and Smith, Michael C., to Southwire Company. Method for lubricating cable in a dry curing system. 4,356,139, Cl. 264-174.000.
Rozsnyai, Tamas: *See—*
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Ruby, Ernest D. Control unit for a multi-unit building. 4,355,760, Cl. 236-47.000.
Rudolph, Marvin J.: *See—*
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Rueckborn, Guenter: *See—*
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Ruell, Hartwig; and Klement, Ekkehard, to Siemens Corporation. Fiber optical measuring device with compensating properties. 4,356,396, Cl. 250-227.000.
Ruseff, Walter Z., to Caterpillar Tractor Co. Unloading means for flow-pressure compensated valve. 4,355,510, Cl. 60-452.000.
Rush-Presbyterian-St. Luke's Medical Center: *See—*
Kuettner, Klaus E., 4,356,261, Cl. 435-68.000.
Russell, Ronald R., to General Electric Company. Control circuit for resetting drawout circuit breaker UVR solenoid. 4,356,526, Cl. 361-59.000.
Russo, John G., to Ripley Company, Inc. Fail-off photosensitive switch. 4,356,405, Cl. 307-117.000.
Rutkowski, Edward V., Jr., to International Business Machines Corporation. Content-addressed text search apparatus for typewriters. 4,355,913, Cl. 400-63.000.
Rutter, Christopher C.: *See—*
Pongrass, Robert G.; and Rutter, Christopher C., 4,355,737, Cl. 222-81.000.
Rydeck, Joseph P. Golf club swing training device. 4,355,810, Cl. 273-186.00C.
Rydin, Carl N. Toy railroad track switch arrangement. 4,355,776, Cl. 246-415.00A.
Ryobi, Ltd.: *See—*
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S. A. Automobiles Citroen: *See*—
Papagni, Robert P., 4,355,708, Cl. 188-196.00D.
S. A. Automobiles Peugeot: *See*—
Papagni, Robert P., 4,355,708, Cl. 188-196.00D.
Sabourin, Edward T.: *See*—
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Sach, Martin R.: *See*—
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Saeki, Keiso; Matsukawa, Hiroharu; and Satomura, Masato, to Fuji Photo Film Co., Ltd. Method for preparing microcapsules. 4,356,109, Cl. 252-316.000.
Saenz, Alfredo, Jr. Test system for cathodic protection circuit of an underground pipeline. 4,356,444, Cl. 324-54.000.
Sage, Thomas L. Rotary hot dog cooker. 4,355,569, Cl. 99-427.000.
St. Louis, Harold E.; and Trumbull, Walter A., to Dow Chemical Company, The. Adjustable plug seal mechanism for heat transfer zone separation in mollow screws for extrusion machines. 4,355,905, Cl. 366-79.000.
St. Regis Paper Company: *See*—
Elford, William J.; Williams, Donald E.; and Miller, Keith H., 4,356,045, Cl. 156-64.000.
Saito, Hiraku; Takagahara, Isamu; Suzuki, Yasuo; Fujita, Tuyosi; Fujii, Katsumi; and Horio, Takekazu, to Oriental Yeast Company. Isoelectric point marker. 4,356,072, Cl. 204-180.00G.
Saito, Iwao. Heart rate bio-feedback system. 4,355,644, Cl. 128-689.000.
Saito, Kazuo, to Tokico Ltd. Disc brake with quickly changeable pads. 4,355,707, Cl. 188-73.320.
Saito, Keishi: *See*—
Ozawa, Akio; Sueyoshi, Susumu; Saito, Keishi; Ishikawa, Kikuo; Yatsuhashi, Kiyomi; Ishii, Satoshi; and Yumino, Masamichi, 4,356,455, Cl. 330-296.000.
Saito, Kenji; and Yamachika, Hiroshi, to Sumitomo Chemical Company, Limited. Process for producing 3-oxocyclopentenes. 4,356,326, Cl. 568-322.000.
Saito, Syuichiro: *See*—
Ohniwa, Takehiko; Senuma, Michio; Shimada, Fumio; Saito, Syuichiro; Shigeta, Yoshihiro; and Aizawa, Hiroshi, 4,355,878, Cl. 354-234.000.
Saito, Tadashi; Nakajima, Toshihiko; and Osada, Toshio, to Hitachi, Ltd. Control circuit for DC motors. 4,356,437, Cl. 318-254.000.
Saitou, Sinichi; Kato, Toshikazu; Kimura, Kenji; Satoh, Ken; Shibata, Tsutomu; Watanabe, Seizo; and Ohshima, Ken, to Olympus Optical Co., Ltd. Double-capstan tape driving device. 4,355,750, Cl. 226-188.000.
Sakabe, Sadao, to Kansai Electric Power, Ltd. Transmission conductor. 4,356,346, Cl. 174-130.000.
Sakaguchi, Hirofumi: *See*—
Tarumi, Noriyoshi; Kawamoto, Kiyoaki; Ueno, Kenji; and Sakaguchi, Hirofumi, 4,355,881, Cl. 355-3.0FU.
Sakamoto, Isao: *See*—
Morimoto, Izumi; and Sakamoto, Isao, 4,356,402, Cl. 307-19.000.
Sakurai, Hieo: *See*—
Makino, Kenya; Sakurai, Hieo; Watanabe, Masaru; and Nishimura, Toshiyuki, 4,356,160, Cl. 423-492.000.
Sakurai, Nobuo: *See*—
Kobayashi, Morimasa; and Sakurai, Nobuo, 4,355,555, Cl. 83-62.100.
Salkazanov, Pierre: *See*—
Bavoux, Robert J. A.; Lemaire, Francis R. J.; and Salkazanov, Pierre, 4,356,548, Cl. 364-200.000.
Sallee, Dennis C.: *See*—
Knepper, J. Irvine; and Sallee, Dennis C., 4,356,002, Cl. 44-62.000.
Salles, Marie-France: *See*—
Zalisz, Rene; and Salles, Marie-France, 4,356,171, Cl. 424-92.000.
Sallmen, Bengt A. L.; Sjogreen, Carl-Axel E.; Mansson, Mans O.; and Ogemark, Keith F. R., to Perstorp AB. Secondary stabilizer. 4,356,110, Cl. 252-407.000.
Salman, Syed: *See*—
Emanuel, Peter R.; Salman, Syed; and Mohiuddin, Gulam, 4,356,230, Cl. 428-290.000.
Salmi, Pekka: *See*—
Karru, Esa; Salmi, Pekka; Paasonen, Hannu; and Helin, Aimo, 4,355,691, Cl. 173-106.000.
Salzmann, Thomas N.: *See*—
Christensen, Burton G.; Ratcliffe, Ronald W.; and Salzmann, Thomas N., 4,356,120, Cl. 260-239.00A.
Sandercock, John R., to RCA Corporation. Thin film thickness monitor. 4,355,903, Cl. 356-382.000.
Sanders Associates, Inc.: *See*—
Baer, Ralph H.; and Cope, Leonard D., 4,355,805, Cl. 273-85.00G.
Chicklis, Evan P., 4,355,893, Cl. 356-4.000.
Cope, Leonard D., 4,355,814, Cl. 273-85.00G.
Sandler, Stanley R.; and Miano, Jeffrey D., to Pennwalt Corporation. Smoke suppressed rigid polyurethane foam. 4,356,274, Cl. 521-120.000.
Sandman, Terry L., to Jobst Institute, Inc. Anti-shock pressure garment. 4,355,632, Cl. 128-24.00R.
Sandoz, Inc.: *See*—
Kelly, Lawrence A., 4,356,167, Cl. 424-38.000.
Sanera Projecting Aktiebolag: *See*—
Oberg, Per O., 4,356,086, Cl. 210-115.000.
Sanford, Lawrence H.: *See*—
Jones, Bradley N.; and Sanford, Lawrence H., 4,355,425, Cl. 2-402.000.
Sanjurjo, Angel; Rowcliffe, David J.; and Bartlett, Robert W., to SRI International. Method of casting silicon into thin sheets. 4,356,141, Cl. 264-332.000.
Sankaran, Venkatesa; and Marvel, Carl S., to United States of America, Air Force. Polyaromatic ether-keto-sulfones curable by Diels-Alder cycloaddition. 4,356,292, Cl. 525-419.000.
Sankaran, Venkatesa: *See*—
Marvel, Carl S.; and Sankaran, Venkatesa, 4,356,298, Cl. 528-173.000.
Santen Pharmaceutical Co., Ltd.: *See*—
Iwao, Junichi; Oya, Masayuki; Baba, Toshio; Iso, Tadashi; and Chiba, Takehisa, 4,356,183, Cl. 424-263.000.
Santi, Gianio G. Thermo-electric power station supplied by geothermal heat source. 4,356,401, Cl. 290-1.00R.
Santrade Ltd.: *See*—
Koppelmann, Eldo K.; and Blackmun, Wayne E., 4,355,932, Cl. 408-188.000.
Sanyo Electric Co., Ltd.: *See*—
Horinouchi, Atsushi, 4,356,370, Cl. 219-10.55B.
Sapkus, Jurgis; Lewis, J. Stephen; and Yamasaki, Toshio, to Mattel, Inc. Skating doll. 4,355,482, Cl. 46-106.000.
Sargent, Alfred E., to Montana Billiard Supply. Billiard table. 4,355,802, Cl. 273-11.00R.
Sarumaru, Kohei: *See*—
Kadowaki, Koju; Sarumaru, Kohei; and Tanaka, Yoshiaki, 4,356,114, Cl. 252-467.000.
Sasaki, Kan: *See*—
Ikemoto, Kazuhito; Katayama, Nobuaki; Terakura, Yukio; and Sasaki, Kan, 4,355,543, Cl. 74-473.00P.
Sasaki, Toshio: *See*—
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Sasano, Rin: *See*—
Kagawa, Naohiko; Yamamoto, Katsumi; Sasano, Rin; Kusakabe, Takao; and Moriya, Yasuhiro, 4,356,148, Cl. 422-9.000.
Sato, Atsushi; and Tsuyuki, Hiroshi, to TDK Electronics Co., Ltd. Ceramic capacitor. 4,356,530, Cl. 361-321.000.
Sato, Hideyo: *See*—
Furuya, Hiroshi; Okada, Munehisa; Takemura, Eiichiro; and Sato, Hideyo, 4,355,756, Cl. 229-4.500.
Sato, Masataro. Metal clamp for scaffolding, temporary building and the like. 4,355,922, Cl. 403-385.000.
Sato, Yoshimi, to Nissan Motor Co., Ltd. Connecting device for automobile seat belt. 4,355,442, Cl. 24-230.0AL.
Satoh, Ken: *See*—
Saitou, Sinichi; Kato, Toshikazu; Kimura, Kenji; Satoh, Ken; Shibata, Tsutomu; Watanabe, Seizo; and Ohshima, Ken, 4,355,750, Cl. 226-188.000.
Satomura, Masato: *See*—
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Saul, John H.: *See*—
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Savin Corporation: *See*—
Landa, Benzion, 4,355,883, Cl. 355-8.000.
Sawada, Shuzo: *See*—
Miura, Shuzi; Yoshida, Tsunemasa; Ono, Shoji; Masuho, Yasuhiko; and Sawada, Shuzo, 4,356,173, Cl. 424-101.000.
Saxena, Ram R.: *See*—
Borden, Peter G.; and Saxena, Ram R., 4,356,341, Cl. 136-249.000.
Saylor, Dana H. Animal feeder with automatic dispenser. 4,355,598, Cl. 119-52.00A.
SCA Development Aktiebolag: *See*—
Hoglund, Hans E.; and Peterson, Per V., 4,356,213, Cl. 427-212.000.
Scandpower, Inc.: *See*—
Smith, Robert D.; and Regazzoni, Pierre, 4,356,061, Cl. 376-254.000.
Scarlata, Robert W. Thermal storage system. 4,355,627, Cl. 126-400.000.
Schadlich, Renate: *See*—
Moraw, Roland; and Schadlich, Renate, 4,356,052, Cl. 156-498.000.
Schatz, Klaus W., to Mobil Oil Corporation. Fluid sampling probe. 4,355,539, Cl. 73-863.110.
Scheel, Russell, to SI Handling, Inc. Inexpensive driverless vehicle. 4,355,580, Cl. 104-166.000.
Schertz, William W.: *See*—
Gorski, Anthony J.; and Schertz, William W., 4,355,522, Cl. 62-340.000.
Schilk, Joan A.: *See*—
McNamara, Harold J.; and Schilk, Joan A., 4,356,161, Cl. 423-573.00R.
Schilling, Hugh K., to Horton Industries, Inc. Spring engaged fluid released fan clutch for a live shaft. 4,355,710, Cl. 192-91.00A.
Schlossman, Irwin S., to Emery Industries, Inc. Carboxyphenylalkanoic acids and lower alkyl esters thereof. 4,356,315, Cl. 560-81.000.
Schluderberg, Donald C.: *See*—
Edwards, Gerald T.; and Schluderberg, Donald C., 4,355,449, Cl. 29-426.200.
Schmall, Karl H. Hazard switch arrangement. 4,356,362, Cl. 200-47.000.
Schmid, Eduard: *See*—
Isler, Walter; and Schmid, Eduard, 4,356,300, Cl. 528-324.000.
Schmid, Gerhard E.: *See*—
Kienle, Helmut; Schmid, Gerhard E.; Steiner, Werner; and Trippel, Gerhard, 4,356,066, Cl. 204-38.00A.

Schmidt, Manfred: *See*—
Cloos, Erwin; Schmidt, Manfred; Kring, Helmut; Schnell, Gerhard; and Thielmann, Joachim, 4,356,378, Cl. 219-124.100.
Schmitz, Heinrich: *See*—
Divisek, Jiri; Schmitz, Heinrich; and Hesse, Renke, 4,356,231, Cl. 428-304.400.
Schmitz, Robert E.; Stearns, David T.; Stegmann, Erwin; McWhorter, Thomas E.; Geiger, Warren F.; and Abrahamsen, Thomas J., to Air Products and Chemicals, Inc. Cryogenic deflashing method. 4,355,488, Cl. 51-319.000.
Schneider, Gernot: *See*—
Steinle, Benedikt; Schneider, Gernot; and Nuenlist, Hans, 4,356,553, Cl. 364-483.000.
Schneider, Wolfgang. Artificial humerus head. 4,355,427, Cl. 3-1.910.
Schnekenburger, Emil; and Schnekenburger, Rudolf, to Coronet Werke Heinrich Schlerf GmbH. Apparatus for holding and displaying brush bodies. 4,355,847, Cl. 300-11.000.
Schnekenburger, Rudolf: *See*—
Schnekenburger, Emil; and Schnekenburger, Rudolf, 4,355,847, Cl. 300-11.000.
Schnell, Gerhard: *See*—
Cloos, Erwin; Schmidt, Manfred; Kring, Helmut; Schnell, Gerhard; and Thielmann, Joachim, 4,356,378, Cl. 219-124.100.
Schoenkopf, Richard W.; and Ross, Donald H. Package dispenser mechanism. 4,355,733, Cl. 221-123.000.
Scholle Corporation: *See*—
Ellert, Roger H., 4,355,493, Cl. 53-113.000.
Scholle, William R., 4,355,742, Cl. 222-490.000.
Scholle, William R., to Scholle Corporation. Dispenser spigot for viscous material. 4,355,742, Cl. 222-490.000.
Scholten, Joseph J. F.: *See*—
de Munck, Nicolaas A.; and Scholten, Joseph J. F., 4,356,125, Cl. 549-475.000.
Scholz, Ray J.; Southern, William C.; and Wieduwilt, Leslie R., Jr., to Sierra Precast, Inc. Mold for forming fireplaces. 4,355,782, Cl. 249-93.000.
Scholz, Wolfgang: *See*—
Neumann, Leopold; Kline, Richard B., II; and Scholz, Wolfgang, 4,356,475, Cl. 340-521.000.
Schon, Werner; and Meinecke, Albrecht, to J. M. Voith GmbH. Rotary screening machine for pulp suspensions. 4,356,085, Cl. 209-273.000.
Schonafinger, Karl; Beyerle, Rudi; Mogilev, Anton; Bohn, Helmut; Just, Melitta; Martorana, Piero A.; and Nitz, Rolf-Eberhard, to Cassella Aktiengesellschaft. 3,4-(Bis-substituted)-1,2,5-oxdiazole 2-oxides, their use and pharmaceutical formulations containing them. 4,356,178, Cl. 424-248.540.
Schreck, Carl E.: *See*—
McGovern, Terrence P.; and Schreck, Carl E., 4,356,180, Cl. 424-250.000.
Schroder, Joris; Bosshard, Hans; Kiml, Jiri; Kostka, Miroslav; and Zimmermann, Walter, to Inventio AG. Group control for elevators. 4,355,705, Cl. 187-29.00R.
Schubert, Herrmann; Pelzl, Gerhard; Zaschke, Horst; Demus, Dietrich; Nothni, Hans-Ulrich; and Kuschel, Frank, to Veb Werk fur Fernsehelektronik. Liquid crystals for electro-optical devices. 4,356,103, Cl. 252-299.100.
Schulz, Volkmar: *See*—
Hess, Peter; Rampel, Hans; and Schulz, Volkmar, 4,355,778, Cl. 248-429.000.
Schumacker, Henri J. J.; and Schumacker, Terese F. Device for dispensing a liquid or a paste in a finely divided manner. 4,355,736, Cl. 222-80.000.
Schumacker, Terese F.: *See*—
Schumacker, Henri J. J.; and Schumacker, Terese F., 4,355,736, Cl. 222-80.000.
Schumann, Werner A., to Atomic Energy Board. Separation of gases. 4,356,005, Cl. 55-17.000.
Schwab, Gerhart; and Davis, Gerald T., to Mead Corporation, The. Encapsulation process. 4,356,108, Cl. 252-316.000.
Schwab, Pierre P., to B/K Patent Development Company, Inc. Modular electrical shunts and switches for integrated circuit applications. 4,356,361, Cl. 200-16.00D.
Schwartz, Arnold A.: *See*—
Cheung, Ki C.; Unkle, Truman F.; Schwartz, Arnold A.; and Hsieh, Raymond J., 4,356,144, Cl. 376-203.000.
Schwarzenbach, Alfred, to BBC Brown, Boveri and Company Limited. Constant pressure storage installation with water supply for gas turbine power plants. 4,355,923, Cl. 405-59.000.
Scott, William D.: *See*—
Cohen, Albert; Brown, Ralph D.; and Scott, William D., 4,355,515, Cl. 60-657.000.
Scott's Liquid Gold, Inc.: *See*—
Wolf, David, 4,355,740, Cl. 222-180.000.
Scovill Inc.: *See*—
Flaherty, John J., Jr.; and Wallin, Gus W., 4,356,381, Cl. 219-283.000.
Szczepanski, Lee. Marine direction finding system. 4,356,491, Cl. 343-113.00R.
Sea Containers Limited: *See*—
Nessfield, Stanley, 4,355,732, Cl. 220-1.500.
Sebald, Richard, to Grundig E.M.V. Device for heating the front lens of a television camera. 4,355,861, Cl. 350-61.000.
Segnini, Robert: *See*—
DiMatteo, Paul; Segnini, Robert; and Rademacher, Paul, 4,355,447, Cl. 29-26.00A.
Seidel, Joseph: *See*—
Jackovitz, John F.; Seidel, Joseph; and Pantier, Earl A., 4,356,101, Cl. 252-182.100.
Seiko Koki Kabushiki Kaisha: *See*—
Kitai, Kiyoshi; Nakagawa, Tadashi; and Ishida, Hiroaki, 4,355,872, Cl. 354-25.000.
Seilly, Alec H.; Mowbray, Dorian F.; Mardell, John E.; and Davison, Michael J., to Lucas Industries Limited. Fuel system for an internal combustion engine. 4,355,620, Cl. 123-499.000.
Sekine, Kenji: *See*—
Hirota, Yukitsugu; Endo, Akira; and Sekine, Kenji, 4,356,489, Cl. 343-7.0VM.
Sekisui Kagaku Kogyo Kabushiki Kaisha: *See*—
Kitagawa, Kouichirou; and Kanno, Eiichi, 4,355,970, Cl. 431-77.000.
Sekitani, Noboru: *See*—
Suganuma, Buro; Sekitani, Noboru; Hatanaka, Yasuaki; and Inoue, Yasuhiro, 4,355,770, Cl. 242-35.50A.
Selim, Harold N., to Hunt, A. H., III, a part interest. Magnetic tape position display system for a sound reproduction system. 4,356,521, Cl. 360-72.200.
Selwitz, Charles M.: *See*—
Harrison, James J.; Sabourin, Edward T.; and Selwitz, Charles M., 4,356,325, Cl. 568-33.000.
Senior, Albert B., III. Wood splitting tool. 4,355,671, Cl. 144-193.00C.
Seno, Takanori: *See*—
Wada, Ryoichi; Seno, Takanori; and Tsuchiya, Mitsuharu, 4,356,566, Cl. 375-116.000.
Senuma, Michio: *See*—
Ohniwa, Takehiko; Senuma, Michio; Shimada, Fumio; Saito, Syuichiro; Shigeta, Yoshihiro; and Aizawa, Hiroshi, 4,355,878, Cl. 354-234.000.
Sewell, Robert G. S.; Pringle, John K.; Backman, Marvin E.; and Finnegan, Stephen A., to United States of America, Navy. Armor. 4,355,562, Cl. 89-36.00A.
Shafer, Peter O.; and Wolley, E. Duane, to General Electric Company. Latching transistor. 4,356,503, Cl. 357-38.000.
Shaffer, David W. Reed construction. 4,355,560, Cl. 84-383.00A.
Shaffer, John W.: *See*—
Broadt, David R.; and Shaffer, John W., 4,355,971, Cl. 431-359.000.
Shah, Nipun M.: *See*—
Cholod, Michael S.; and Shah, Nipun M., 4,356,299, Cl. 528-279.000.
Shanks, Bruce E., to General Electric Company. Vehicle headlamp having an integral buggy spring mounting assembly. 4,356,539, Cl. 362-273.000.
Sharpe, Louis H.: *See*—
Lovinger, Andrew J.; and Sharpe, Louis H., 4,356,505, Cl. 357-72.000.
Shatterproof Glass Corporation: *See*—
McKelvey, Harold E., 4,356,073, Cl. 204-192.00R.
Sheffer Collet Company: *See*—
Beery, Jay D., 4,355,816, Cl. 279-2.00R.
Shefler, Gerald E.; and Weaver, Ralph J., III, to Ford Industries, Inc. Digital memory audio playback apparatus. 4,356,351, Cl. 179-1.00B.
Sheldon, Jerome F., to Rexnord Inc. Polymeric chain link with integral telescoping barrel. 4,355,502, Cl. 59-84.000.
Shell Oil Company: *See*—
Blytas, George C.; and Diaz, Zaida, 4,356,155, Cl. 423-226.000.
Drent, Eit, 4,356,126, Cl. 260-410.90R.
McNamara, Harold J.; and Schilk, Joan A., 4,356,161, Cl. 423-573.00R.
Nielsen, Robert P.; and La Rochelle, John H., 4,356,312, Cl. 549-534.000.
Payne, George B.; and Soloway, Samuel B., 4,356,023, Cl. 71-88.000.
Shen, Peter I., to Hughes Aircraft Company. Laser beam tube with helical gas flow for reducing thermal blooming in the laser beam. 4,356,565, Cl. 372-61.000.
Sherman, Guy J., to Sherman Laboratories, Inc. Soft contact lens cold disinfectant solution. 4,356,100, Cl. 252-106.000.
Sherman Laboratories, Inc.: *See*—
Sherman, Guy J., 4,356,100, Cl. 252-106.000.
Sherwood, Edward F., to Westinghouse Electric Corp. Slidable door assembly. 4,355,486, Cl. 49-409.000.
Shibanai, Ichiro; Horikoshi, Kouki; and Nakamura, Nobuyuki. Fragrant synthetic resin product and method of producing the same. 4,356,115, Cl. 252-522.00A.
Shibata, Tsutomu: *See*—
Saitou, Sinichi; Kato, Toshikazu; Kimura, Kenji; Satoh, Ken; Shibata, Tsutomu; Watanabe, Seizo; and Ohshima, Ken, 4,355,750, Cl. 226-188.000.
Shibuya, Satoru: *See*—
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Shigeta, Yoshihiro: *See*—
Ohniwa, Takehiko; Senuma, Michio; Shimada, Fumio; Saito, Syuichiro; Shigeta, Yoshihiro; and Aizawa, Hiroshi, 4,355,878, Cl. 354-234.000.
Shimada, Fumio: *See*—
Ohniwa, Takehiko; Senuma, Michio; Shimada, Fumio; Saito, Syuichiro; Shigeta, Yoshihiro; and Aizawa, Hiroshi, 4,355,878, Cl. 354-234.000.
Shimada, Yukio, to Nissan Motor Company, Ltd. Automatic car-cooler clutch control apparatus. 4,355,523, Cl. 62-133.000.

Shimada, Yukio; Suzuki, Naoyoshi; Ohashi, Toshio; and Inoshita, Yasushi, to Nissan Motor Co., Ltd. System for controlling a vehicle mounted air conditioner. 4,355,681, Cl. 165-16.000.

Shimajiri, Tokiji; Toyoda, Kenichi; and Yamazaki, Takahumi, to Fujitsu Fanuc Limited. Automatic tool changer of machining center. 4,355,446, Cl. 29-26.00A.

Shimizu, Hiroshi; and Watanabe, Hiroshi, to Tohoku Metal Industries, Ltd. Piezoelectric resonators of an energy-trapping type of a width extensional vibratory mode. 4,356,421, Cl. 310-320.000.

Shimizu, Kenzo; Fukunaga, Yukio; and Tsuda, Hiroshi, to Nissan Motor Co., Ltd. Glove compartment. 4,355,837, Cl. 296-37.120.

Shimizu, Norio; Odawara, Yoji; and Masaki, Yasunori, to Hitachi, Ltd. Method for treating waste water. 4,356,092, Cl. 210-611.000.

Shimizu, Norio; Odawara, Yoji; and Masaki, Yasunori, to Hitachi, Ltd. Microorganism for treating waste water. 4,356,268, Cl. 435-253.000.

Shimizu, Yoichi, to Kabushiki Kaisha Maruyama Seisakusho. Heddle frame. 4,355,667, Cl. 139-91.000.

Shinozaki, Fumiaki: *See—*
Tachikawa, Hiromichi; Takahashi, Yohnosuke; Shinozaki, Fumiaki; and Ikeda, Tomoaki, 4,356,255, Cl. 430-325.000.
Takahashi, Yohnosuke; Tachikawa, Hiromichi; Shinozaki, Fumiaki; and Ikeda, Tomoaki, 4,356,254, Cl. 430-296.000.

Shipley, Randall S.; and Lowery, Kirby, Jr., to Dow Chemical Company, The. High efficiency catalyst containing titanium and zirconium for polymerizing olefins. 4,356,111, Cl. 252-429.00B.

Shirouchi, Shoji: *See—*
Sugiyama, Takeshi; Shirouchi, Shoji; Onoda, Mamoru; Kawaguchi, Fumikazu; and Fujita, Isao, 4,356,027, Cl. 75-0.50R.

Shively, James F.: *See—*
Stone, David S.; and Shively, James F., 4,356,430, Cl. 315-4.000.

Shoff, Daniel J.: *See—*
Buck, Gordon H.; Cayley, Paul W., Jr.; Hardwick, Martha K.; and Shoff, Daniel J., 4,355,806, Cl. 273-85.00G.

Shuffman, David K.: *See—*
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Shultz, William E. Method and apparatus for injecting viscous materials. 4,355,702, Cl. 184-1.00D.

SI Handling, Inc.: *See—*
Scheel, Russell, 4,355,580, Cl. 104-166.000.

Sid-Ahmed, Abdel-Hadi: *See—*
Boon, Wyndham H.; and Sid-Ahmed, Abdel-Hadi, 4,356,219, Cl. 427-386.000.

Siemens Aktiengesellschaft: *See—*
Aulich, Hubert; and Auracher, Franz, 4,355,863, Cl. 350-96.150.
Boschulte, Rainer; Koehnecke, Heinrich; and Muecke, Siegfried, 4,356,485, Cl. 340-825.170.
Fettweis, Alfred, 4,356,464, Cl. 333-173.000.
Guntner, Helmut; and Wittenzellner, Ernst, 4,356,414, Cl. 307-455.000.
Harbauer, Werner; and Wiessner, Edgar, 4,356,363, Cl. 200-50.00C.
Hilliges, Friedrich, 4,356,352, Cl. 179-7.10R.
Neumann, Leopold; Kline, Richard B., II; and Scholz, Wolfgang, 4,356,475, Cl. 340-521.000.

Siemens Corporation: *See—*
Ruell, Hartwig; and Klement, Ekkehard, 4,356,396, Cl. 250-227.000.

Sierra Precast, Inc.: *See—*
Scholz, Ray J.; Southern, William C.; and Wieduwilt, Leslie R., Jr., 4,355,782, Cl. 249-93.000.

Sifford, Perry P.; and Griffin, Jerry H., to United Technologies Corporation. Blade damper. 4,355,957, Cl. 416-145.000.

Sigmund, Frank J.: *See—*
Gedaly, Jerrell M.; Sadowski, Joseph P.; Kirkland, David D.; and Sigmund, Frank J., 4,356,042, Cl. 148-1.500.

Siiberg, Hemming G., to Edison International, Inc. Air operated DC switch. 4,356,365, Cl. 200-83.00J.

Silvestrini, Jesus A., to IMDEC S.R.L. Apparatus for separating the pulp from the skin of fruit such as tomatoes. 4,355,572, Cl. 99-516.000.

Simons, Kai; and Helenius, Ari, to Europaisches Laboratorium Fur. Method of preparing an immunogenic membrane protein aggregate of influenza and parainfluenza viruses and rhabdoviruses. 4,356,169, Cl. 424-89.000.

Singer Company, The: *See—*
Ketterer, Stanley J., 4,355,590, Cl. 112-184.000.
Ross, Roger J., 4,355,545, Cl. 74-567.000.

Sis-Ter S.p.A.: *See—*
Di Salvo, Francesco, 4,355,639, Cl. 128-214.00R.

Sjogreen, Carl-Axel E.: *See—*
Sallmen, Bengt A. L.; Sjogreen, Carl-Axel E.; Mansson, Mans O.; and Ogemark, Keith F. R., 4,356,110, Cl. 252-407.000.

Skerlos, Peter C.; Snopko, Paul A.; Templin, Frank C.; and Zato, Thomas J., to Zenith Radio Corporation. Microcomputer-controlled television/telephone system and method therefore. 4,356,509, Cl. 358-85.000.

Skierski, Edwin J., to USM Corporation. Pointing machine. 4,355,430, Cl. 10-9.000.

Skinner, Robert T. J., to Lucas Industries Limited. Liquid fuel pumping apparatus. 4,355,609, Cl. 123-373.000.

Slavik, William H.; Carlson, William P.; and McGowan, Michael J., to Nuvatec, Inc. Teaching device. 4,355,984, Cl. 434-335.000.

Slusser, Boyd C., to Herman Miller, Inc. Drawer interlock system. 4,355,851, Cl. 312-215.000.

Smirnov, Boris A.: *See—*
Kapitanov, Nikolai N.; Petrova, Natalya P.; Judenich, Vsevolod V.; Kharchenko, Vladimir P.; Smirnov, Boris A.; Ippolitov, Vladimir V.; and Lankina, Nadezhda M., 4,355,751, Cl. 227-19.000.

Smith, Charles P., Jr. Emergency rescue system. 4,355,699, Cl. 182-12.000.

Smith, Fred J., to Digital Products Corporation. Techniques for detecting a condition of response on a telephone line. 4,356,348, Cl. 179-1.0MN.

Smith, Jack B. Loading device for firewood. 4,355,831, Cl. 294-11.000.

Smith, James D. B.; and Kauffman, Robert N., to Westinghouse Electric Corp. Catechol or pyrogallol containing flexible insulating tape having low gel time. 4,356,417, Cl. 310-43.000.

Smith, Michael C.: *See—*
Rowland, Bobby A.; Tate, Stanley L.; and Smith, Michael C., 4,356,139, Cl. 264-174.000.

Smith, Robert D.; and Regazzoni, Pierre, to Scandpower, Inc. Gamma thermometer having combined thermal bridge and centering means. 4,356,061, Cl. 376-254.000.

Smith, Robert F.; and Walters, Dwight E., to R. F. Smith Corp. Method for measuring the level of hydrogen sulfide in geothermal steam. 4,355,997, Cl. 23-230.0EP.

Smith, William B., to Pipe Line Development Company, The. Pipeline plug and bypass. 4,355,656, Cl. 137-318.000.

SMT Machine Company AB: *See—*
Svensson, Rolf; and Svensson, Ingemar, 4,355,548, Cl. 74-826.000.

Smulkstys, Louis S.: *See—*
Mott, Richard C.; and Smulkstys, Louis S., 4,356,439, Cl. 318-685.000.

Snamprogetti S.p.A.: *See—*
Matteelli, Rolando; and Ciuti, Brunello, 4,356,088, Cl. 210-198.100.

Snellling, Christopher, to Xerox Corporation. Multiple function reproduction apparatus. 4,355,882, Cl. 355-3.0BE.

Snopko, Paul A.: *See—*
Skerlos, Peter C.; Snopko, Paul A.; Templin, Frank C.; and Zato, Thomas J., 4,356,509, Cl. 358-85.000.

Snowdon, Brian. Flow control device. 4,355,929, Cl. 406-125.000.

Snyder, David E., to U.S. Industries, Inc. Pilot valve with indicating lockout knob. 4,355,658, Cl. 137-557.000.

Soch, Fredrich A., to Minnesota Mining and Manufacturing Company. Fluorochemical foam stabilizer and foamed polyurethanes made therewith. 4,356,273, Cl. 521-114.000.

S.A. Benoist Girard & Cie: *See—*
Deloison, Victor; and Pottier, Gilbert, 4,355,428, Cl. 3-1.910.

Societe Anonyme Francaise du Ferodo: *See—*
Antoine, Jacquet M., 4,355,752, Cl. 237-12.30B.

Societe Francaise d'Equipements pour la Navigation Arrienne: *See—*
Chombard, Pierre A.; and Darni, Daniel, 4,355,540, Cl. 74-5.100.

Societe Nationale de l'Amiante: *See—*
Lalancette, Jean M.; and Dunnigan, Jacques, 4,356,057, Cl. 162-3.000.

Societe pour L'Etude et la Fabrication de Circuits Integres Speciaux EFCIS: *See—*
Montier, Michel, 4,356,055, Cl. 156-626.000.

Soeda, Kozi; Hoshikawa, Katuyuki; and Kimura, Akitaka, to Sumitomo Rubber Industries, Ltd. Method of forming puncture preventing layer for tire and apparatus employed therefor. 4,356,214, Cl. 427-233.000.

Solar, Jeffrey P.: *See—*
Diamond, Steven E.; Mares, Frank; Muccigrosso, Deborah A.; and Solar, Jeffrey P., 4,356,311, Cl. 549-524.000.

Solid Photography, Inc.: *See—*
DiMatteo, Paul; Segnini, Robert; and Rademacher, Paul, 4,355,447, Cl. 29-26.00A.

Soloway, Samuel B.: *See—*
Payne, George B.; and Soloway, Samuel B., 4,356,023, Cl. 71-88.000.

Solvay & Cie: *See—*
Georlette, Pierre; and Bouteille, Rene, 4,356,226, Cl. 428-246.000.

Soneruds Maskin Aktiebolag: *See—*
Engkvist, Lars G., 4,355,476, Cl. 37-117.500.

Sonnonstine, Terry J.: *See—*
Leichter, Louis M.; Sonnonstine, Terry J.; Stofko, John J., Jr.; and Beretta, Paolo, 4,356,244, Cl. 430-82.000.

Sony Corporation: *See—*
Doi, Toshitada; Furukawa, Shunsuke; and Nanba, Kenji, 4,356,564, Cl. 371-40.000.
Okada, Takashi, 4,356,508, Cl. 358-29.000.
Sumiyoshi, Hiroji; Suzuki, Mitsumasa; and Okazaki, Hiroshi, 4,356,515, Cl. 358-246.000.
Takano, Masayuki; and Hosoi, Sadao, 4,356,522, Cl. 360-77.000.
Tsujimura, Katsuhito, 4,356,511, Cl. 358-181.000.

Soref, Richard A., to Sperry Corporation. Magnetooptic switching devices. 4,355,864, Cl. 350-96.180.

Sorimachi, Akira, to Katoh Electrical Machinery Co. Ltd. Document hold-down cover arrangement for a copy machine. 4,355,887, Cl. 355-25.000.

Sorin Biomedica S.p.A.: *See—*
Callegaro, Lanfranco; Boniolo, Antonio; Denti, Ennio; Rosa, Umberto; and Rossi, Valdano, 4,356,267, Cl. 435-179.000.

Soto, John. Shock-sensitive electrical switch. 4,356,364, Cl. 200-61.520.

Southern, William C.: *See—*
Scholz, Ray J.; Southern, William C.; and Wieduwilt, Leslie R., Jr., 4,355,782, Cl. 249-93.000.

Southwire Company: *See—*
Rowland, Bobby A.; Tate, Stanley L.; and Smith, Michael C., 4,356,139, Cl. 264-174.000.

Spector, George: *See—*
Bottamiller, Wilbert O.; and Spector, George, 4,355,585, Cl. 108-153.000.
Speranza, George P.: *See—*
Cuscurida, Michael; and Speranza, George P., 4,356,330, Cl. 568-756.000.
Sperry Corporation: *See—*
Soref, Richard A., 4,355,864, Cl. 350-96.180.
Spiegelman, Stanley R.: *See—*
McShane, James L.; Golick, Leonard R.; and Spiegelman, Stanley R., 4,355,536, Cl. 73-633.000.
Spokane Crusher Mfg. Co.: *See—*
Warren, Kenneth D.; and Tenold, Gregory G., 4,355,769, Cl. 241-300.000.
Sprague Electric Company: *See—*
Kopel, Jeffrey L., 4,356,529, Cl. 361-304.000.
Spreading Machine Exchange, Inc.: *See—*
Costigan, Conrad A., 4,355,794, Cl. 270-31.000.
Sprengling, Gerhard R.; and Cargnel, Louis A., to Westinghouse Electric Corp. Porous encapsulating composition for electrical apparatus. 4,356,237, Cl. 428-404.000.
SRI International: *See—*
Sanjurjo, Angel; Rowcliffe, David J.; and Bartlett, Robert W., 4,356,141, Cl. 264-332.000.
Stachiw, Jerry D., to United States of America, Navy. Spherical segment insertion apparatus. 4,355,867, Cl. 350-319.000.
Stafford, Willie M., to Goodyear Tire & Rubber Company, The. Method and apparatus for treating textile cord. 4,356,212, Cl. 427-175.000.
Stagg, Charles M.; and Tribble, Ronald L., to Philips, Roxane, Inc. Chemical castration. 4,356,189, Cl. 424-317.000.
Stahlhut, Leo G.; Garnett, Willard R.; and Kenyon, Lewis W., to Emerson Electric Co. Lighting fixture retainer hook. 4,356,537, Cl. 362-148.000.
Stamicarbon, B.V.: *See—*
de Munck, Nicolaas A.; and Scholten, Joseph J. F., 4,356,125, Cl. 549-475.000.
Stamper, John R., to Baker Perkins Holdings Limited. Travelling baking oven. 4,355,972, Cl. 432-148.000.
Standard Oil Company, The: *See—*
Pesa, Frederick A.; and Graham, Anne M., 4,356,124, Cl. 260-326.5FN.
Stanley Electric Co., Ltd.: *See—*
Ikenoue, Tsuneo; Liu, Shin-yng; Umemoto, Shuichi; and Arai, Naoki, 4,356,541, Cl. 363-20.000.
Stapley, Ronald B., to Carnation Company. Animal litter. 4,355,593, Cl. 119-1.000.
Starkloff, Bernd: *See—*
Weisser, Gunter; Starkloff, Bernd; and Stoesser, Klaus, 4,355,908, Cl. 374-39.000.
Starp, Franz. Control device having an internal electric or voltage source. 4,355,876, Cl. 354-202.000.
Stauffer Chemical Company: *See—*
Carron, Mark S.; La Barbera, Ronald S.; Van Brocklin, Lester P.; and Jain, Pawan K., 4,356,130, Cl. 260-989.000.
Fancher, Llewellyn W., 4,356,022, Cl. 71-87.000.
Felix, Raymond A., 4,356,026, Cl. 71-120.000.
Gaughan, Edmund J.; and Kezerian, Charles, 4,356,025, Cl. 71-100.000.
Stearns, David T.: *See—*
Schmitz, Robert E.; Stearns, David T.; Stegmann, Erwin; McWhorter, Thomas E.; Geiger, Warren F.; and Abrahamsen, Thomas J., 4,355,488, Cl. 51-319.000.
Steckley, Dale. Livestock barn ventilation system. 4,355,568, Cl. 98-33.00A.
Steel, Margaret L.: *See—*
Cowen, Geoffrey; Norton-Berry, Philip; and Steel, Margaret L., 4,356,133, Cl. 264-8.000.
Stegmann, Erwin: *See—*
Schmitz, Robert E.; Stearns, David T.; Stegmann, Erwin; McWhorter, Thomas E.; Geiger, Warren F.; and Abrahamsen, Thomas J., 4,355,488, Cl. 51-319.000.
Stein, Arthur A.; and Goldman, Max, to Pathology Products Ltd. Apparatus for precisely regulating the paraffin temperature in an electrically heated tissue processor. 4,356,385, Cl. 219-441.000.
Steiner, Werner: *See—*
Kienle, Helmut; Schmid, Gerhard E.; Steiner, Werner; and Trippel, Gerhard, 4,356,066, Cl. 204-38.00A.
Steinle, Benedikt; Schneider, Gernot; and Nuenlist, Hans, to LGZ Landis & Gyr Zug AG. Method for the measuring of electrical power. 4,356,553, Cl. 364-483.000.
Stelling, Gary D.: *See—*
Brodnyan, John G.; De Witt, Walter G., III; Gill, Robert A.; and Stelling, Gary D., 4,356,229, Cl. 428-288.000.
Stemmle, Denis J., to Xerox Corporation. Forward order document copying method. 4,355,880, Cl. 355-3.0SH.
Stenkvist, Sven-Einar, to ASEA Aktiebolag. DC Arc furnace having a shielded arc. 4,356,340, Cl. 373-107.000.
Stenzenberger, Horst, to Technochemie GmbH. Fiber materials preimpregnated with duromeric polyimide resins and process for their preparation. 4,356,227, Cl. 428-265.000.
Stephan, Karl. Piling structure and methods. 4,355,927, Cl. 405-233.000.
Stephens, Noel W. F.: *See—*
Cairns, Angus H.; Houston, Nicholas J.; and Stephens, Noel W. F., 4,355,895, Cl. 356-141.000.
Sterki, Armin, to Maag Gear-Wheel & Machine Co. Ltd. Method of determining the boundaries of a measuring path of a gear flank testing apparatus and gear flank testing apparatus for performance of the method. 4,356,556, Cl. 364-560.000.
Sterrett, William H.: *See—*
Brosch, Eric J.; and Sterrett, William H., 4,356,016, Cl. 65-1.000.
Sterzer, Fred, to RCA Corporation. Frequency discriminator utilizing a transferred electron device. 4,356,415, Cl. 307-522.000.
Stevens, Myron T., to Outboard Marine Corporation. Outboard motor with elevated horizontal pivot axis. 4,355,986, Cl. 440-53.000.
Stevens, Phillip E.: *See—*
Jensen, Thomas C.; Stevens, Phillip E.; and Landry, Henry J., Jr., 4,355,690, Cl. 172-311.000.
Stewart, Jimmy L., to General Battery Corporation. Open and short circuit test apparatus. 4,356,239, Cl. 429-7.000.
Stewart-Warner Corporation: *See—*
Bjorn, Thomas E.; and Kao, Mark C. C., 4,355,761, Cl. 239-126.000.
Stiller, Walter: *See—*
Pause, Hans; and Stiller, Walter, 4,355,453, Cl. 29-460.000.
Stoeckli, Oscar W.; and Berry, David J., to General Foods Corporation. Aromatizing apparatus. 4,355,571, Cl. 99-485.000.
Stoesser, Klaus: *See—*
Weisser, Gunter; Starkloff, Bernd; and Stoesser, Klaus, 4,355,908, Cl. 374-39.000.
Stofko, John J., Jr.: *See—*
Leichter, Louis M.; Sonnonstine, Terry J.; Stofko, John J., Jr.; and Beretta, Paolo, 4,356,244, Cl. 430-82.000.
Stokker, Gerald E.: *See—*
Cragoe, Edward J., Jr.; Stokker, Gerald E.; and Gould, Norman P., 4,356,313, Cl. 560-53.000.
Cragoe, Edward J., Jr.; Stokker, Gerald E.; and Gould, Norman P., 4,356,314, Cl. 560-53.000.
Stolpin, Roger M. Kit for assembling geodesic structure. 4,355,781, Cl. 249-64.000.
Stone, David S.; and Shively, James F., to Varian Associates, Inc. Gyrotron cavity resonator with an improved value of Q. 4,356,430, Cl. 315-4.000.
Stone & Webster Engineering Corp.: *See—*
Woebcke, Herman N.; Bhojwani, Arju H.; and Gartside, Robert J., 4,356,151, Cl. 422-145.000.
Storm, James P., Jr. Hand tool for scraping paint from paint can. 4,355,432, Cl. 15-245.000.
Strahan, Virgil H.: *See—*
Quick, William H.; James, Kenneth A.; and Strahan, Virgil H., 4,355,910, Cl. 374-162.000.
Strange, Victor E.: *See—*
Poole, Joseph J.; and Strange, Victor E., 4,355,547, Cl. 74-690.000.
Stroh, Walter: *See—*
Will, Gerhard; Stroh, Walter; and Zechnall, Martin, 4,355,550, Cl. 74-872.000.
Stroud, Lebern W. Alternator coil winding. 4,356,418, Cl. 310-184.000.
Stuckenbrok, August: *See—*
Stuckenbrok, Freder; and Stuckenbrok, August, 4,355,603, Cl. 123-18.00R.
Stuckenbrok, Freder; and Stuckenbrok, August. Internal combustion engine. 4,355,603, Cl. 123-18.00R.
Sudo, Fumio: *See—*
Morishita, Hitoshi; Bada, Hajime; and Sudo, Fumio, 4,356,032, Cl. 75-52.000.
Sueyoshi, Susumu, to Pioneer Electronic Corporation. Reduced noise-improved gain transistor circuit. 4,356,453, Cl. 330-277.000.
Sueyoshi, Susumu; and Ishikawa, Kikuo, to Pioneer Electronic Corporation. Equalizer amplifier. 4,356,454, Cl. 330-294.000.
Sueyoshi, Susumu: *See—*
Ozawa, Akio; Sueyoshi, Susumu; Saito, Keishi; Ishikawa, Kikuo; Yatsuhashi, Kiyomi; Ishii, Satoshi; and Yumino, Masamichi, 4,356,455, Cl. 330-296.000.
Suganuma, Buro; Sekitani, Noboru; Hatanaka, Yasuaki; and Inoue, Yasuhiro, to Murata Kikai Kabushiki Kaisha. Cop supplying apparatus for automatic winding machine. 4,355,770, Cl. 242-35.50A.
Sugiura, Hiroaki: *See—*
Yoshino, Yataro; Ota, Akiho; and Sugiura, Hiroaki, 4,355,728, Cl. 215-1.00C.
Sugiyama, Hiroyuki, to Komori Printing Machinery Co., Ltd. Paper feed control apparatus for use in sheet printing presses. 4,355,800, Cl. 271-229.000.
Sugiyama, Takeshi; Shirouchi, Shoji; Onoda, Mamoru; Kawaguchi, Fumikazu; and Fujita, Isao, to Kobe Steel, Limited. Iron ore pellets containing magnesium oxide. 4,356,027, Cl. 75-0.50R.
Sulzer Brothers Limited: *See—*
Bosshard, Ernst, 4,356,062, Cl. 376-272.000.
Sumitomo Chemical Company, Limited: *See—*
Saito, Kenji; and Yamachika, Hiroshi, 4,356,326, Cl. 568-322.000.
Sumitomo Rubber Industries, Ltd.: *See—*
Soeda, Kozi; Hoshikawa, Katuyuki; and Kimura, Akitaka, 4,356,214, Cl. 427-233.000.
Sumiyoshi, Hiroji; Suzuki, Mitsumasa; and Okazaki, Hiroshi, to Sony Corporation. Cathode ray tube. 4,356,515, Cl. 358-246.000.
Sundstrand Corporation: *See—*
Fulkerson, Thomas R.; and Hawkins, Royal R., 4,355,509, Cl. 60-449.000.
Glennon, Timothy F., 4,356,408, Cl. 307-254.000.
Super, Daniel J.: *See—*
Kimzey, Paul W.; and Super, Daniel J., 4,355,435, Cl. 15-347.000.
Suschitzky, John L.: *See—*
Payling, David W.; and Suschitzky, John L., 4,356,181, Cl. 424-258.000.

Susnjara, Kenneth J.; and Diamond, Michael N., to Thermwood Corporation. Method and apparatus for compensating for system error in an industrial robot control. 4,356,554, Cl. 364-513.000.

Sutco, Inc.: *See*—
Hollier, Joseph H., Jr., 4,355,771, Cl. 242-56.00R.

Suzuki, Katumi: *See*—
Iida, Yasuo; Suzuki, Katumi; and Endo, Nobuhiro, 4,356,223, Cl. 428-156.000.

Suzuki, Mitsumasa: *See*—
Sumiyoshi, Hiroji; Suzuki, Mitsumasa; and Okazaki, Hiroshi, 4,356,515, Cl. 358-246.000.

Suzuki, Naoyoshi: *See*—
Shimada, Yukio; Suzuki, Naoyoshi; Ohashi, Toshio; and Inoshita, Yasushi, 4,355,681, Cl. 165-16.000.

Suzuki, Takehiko: *See*—
Nakanishi, Yoshiyuki; Akazawa, Yoji; Ikeda, Noriaki; and Suzuki, Takehiko, 4,356,112, Cl. 252-435.000.

Suzuki, Yasoji; and Takada, Minoru, to Tokyo Shibaura Denki Kabushiki Kaisha. Flip-flop circuit. 4,356,411, Cl. 307-272.00A.

Suzuki, Yasuo: *See*—
Saito, Hiraku; Takagahara, Isamu; Suzuki, Yasuo; Fujita, Tuyosi; Fujii, Katsumi; and Horio, Takekazu, 4,356,072, Cl. 204-180.00G.

Svensson, Ingemar: *See*—
Svensson, Rolf; and Svensson, Ingemar, 4,355,548, Cl. 74-826.000.

Svensson, Rolf; and Svensson, Ingemar, to SMT Machine Company AB. Tool turret. 4,355,548, Cl. 74-826.000.

Sweeney, Edward E.; and Magowan, Paul N., to Westlake, E. B., Jr., a part interest. Automatic control of bubble size in blown film. 4,355,966, Cl. 425-140.000.

Sweeney, William M.; and Herbstman, Sheldon, to Texaco Inc. Method of extending hydrocarbon fuels including gasolines and fuels heavier than gasoline. 4,356,001, Cl. 44-56.000.

Swesey, Calvin M.: *See*—
Church, Fredrick Z.; and Swesey, Calvin M., 4,355,553, Cl. 82-4.00R.

Swett, H. Robert, Jr. Golf club aligner. 4,355,809, Cl. 273-183.00D.

Swieskowski, Henry P., to United States of America, Army. Dual rate firing mechanism. 4,355,563, Cl. 89-130.000.

Swistak, Gregory B.: *See*—
Cole, David L.; Swistak, Gregory B.; Ryon, Randall C.; Lama, William L.; and Northrup, Karl A., 4,355,891, Cl. 355-57.000.

Sy, Angel, to Lummus Company, The. Purging of inerts in chlorinated hydrocarbon production. 4,356,336, Cl. 570-243.000.

Systemation Inc.: *See*—
Teates, N. Grove; and Mayhall, Riley H., Jr., 4,355,496, Cl. 53-587.000.

Szabo, Imre: *See*—
Szendro, Peter; Benko, Janos; and Szabo, Imre, 4,355,989, Cl. 474-94.000.

Szabo, Lajos: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Dancsi, Lajos; Keve, Tibor; and Drexler, Ferenc, 4,356,305, Cl. 546-51.000.

Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Dancsi, Lajos; Keve, Tibor; and Drexler, Ferenc, to Richter Gedeon Vegyeszeti Gyar Rt. Process for the preparation of halovincamone derivatives. 4,356,305, Cl. 546-51.000.

Szecsy, Alek P.: *See*—
Lange, Roger W.; and Szecsy, Alek P., 4,356,233, Cl. 428-336.000.

Szendro, Peter; Benko, Janos; and Szabo, Imre, to Godolloi Agrartudomanyi Egyetem. Gear unit for power-saving drive of working elements of rotary or oscillatory motion, especially of agricultural cutter drums and peg drums. 4,355,989, Cl. 474-94.000.

Szendrodi, Valer; Radics, Gyula; Varga, Tivadar; Vass, Tibor; and Gyurics, Karoly, to Ikarus Karosszeria- es Jarmugyar. Closed vehicle and a complex equipment for managing services at airports. 4,355,840, Cl. 296-179.000.

Szita, Jeno G.; and DiLeone, Roland R., to American Cyanamid Company. Synthesis of oxyalkylated polyamino-1,3,5-triazines. 4,356,304, Cl. 544-196.000.

Tabata, Yoshitomi: *See*—
Nakao, Makoto; Nakao, Toshiko; Nagai, Fumiko; Dogen, Masako; and Tabata, Yoshitomi, 4,356,172, Cl. 424-101.000.

Tabei, Masatoshi; Takeda, Keiji; Kawaziri, Kazuhiro; and Higashi, Akio, to Fuji Photo Film Co., Ltd. Method of making α-silicon powder, and electrophotographic materials incorporating said powder. 4,356,246, Cl. 430-136.000.

Tabor, Edward; and Gerety, Robert J., to United States of America, Health & Human Services. Detection of non-A, non-B hepatitis associated antigen. 4,356,164, Cl. 424-1.000.

Tachikawa, Hiromichi; Takahashi, Yohnosuke; Shinozaki, Fumiaki; and Ikeda, Tomoaki, to Fuji Photo Film Co., Ltd. Photosensitive members and a process for forming patterns using the same. 4,356,255, Cl. 430-325.000.

Tachikawa, Hiromichi: *See*—
Takahashi, Yohnosuke; Tachikawa, Hiromichi; Shinozaki, Fumiaki; and Ikeda, Tomoaki, 4,356,254, Cl. 430-296.000.

Tadokoro, Eiichi; Masuda, Haruo; Yamaguchi, Nobutaka; and Fujiyama, Masaaki, to Fuji Photo Film Co., Ltd. Method for producing magnetic recording medium. 4,356,232, Cl. 428-325.000.

Taiho Kogyo Co., Ltd.: *See*—
Fukuoka, Tatsuhiko; Ichikawa, Shigeo; and Nomichi, Satoru, 4,355,529, Cl. 73-412.000.

Taira, Jyoji: *See*—
Funabeshi, Katsunori; and Taira, Jyoji, 4,356,536, Cl. 362-72.000.

Tajiri, Koji; Oohara, Mikio; and Maruo, Kiyoshi, to Teijin Limited. Cohesive bulky carpet yarn of a polyamide continuous multifilament and a cut pile carpet. 4,355,592, Cl. 112-410.000.

Takada, Minoru: *See*—
Suzuki, Yasoji; and Takada, Minoru, 4,356,411, Cl. 307-272.00A.

Takagahara, Isamu: *See*—
Saito, Hiraku; Takagahara, Isamu; Suzuki, Yasuo; Fujita, Tuyosi; Fujii, Katsumi; and Horio, Takekazu, 4,356,072, Cl. 204-180.00G.

Takahashi, Masaaki: *See*—
Kobayashi, Yoshiro; Kumadaki, Itsumaro; Takahashi, Masaaki; and Yamauchi, Takashi, 4,356,335, Cl. 570-129.000.

Takahashi, Teruo; and Ito, Rintaro. Method of coiling a wire in a tube. 4,355,459, Cl. 29-605.000.

Takahashi, Tomoyuki: *See*—
Tsutsumi, Yoshio; and Takahashi, Tomoyuki, 4,355,542, Cl. 74-467.000.

Takahashi, Toru: *See*—
Hosono, Nagao; Kinoshita, Koichi; and Takahashi, Toru, 4,356,245, Cl. 430-122.000.

Takahashi, Toshiyuki: *See*—
Kubota, Hitoshi; Takahashi, Toshiyuki; and Hayashida, Yoshihiro, 4,355,512, Cl. 60-534.000.

Takahashi, Yohnosuke; Tachikawa, Hiromichi; Shinozaki, Fumiaki; and Ikeda, Tomoaki, to Fuji Photo Film Co., Ltd. Image-forming method using o-quinone diazide and basic carbonium dye. 4,356,254, Cl. 430-296.000.

Takahashi, Yohnosuke: *See*—
Tachikawa, Hiromichi; Takahashi, Yohnosuke; Shinozaki, Fumiaki; and Ikeda, Tomoaki, 4,356,255, Cl. 430-325.000.

Takai, Isao, to Oda Gosen Kogyo Kabushiki Kaisha. Fabrics having salt-and-pepper patterns and crimped filament yarns for producing the same. 4,355,499, Cl. 57-205.000.

Takano, Masayuki; and Hosoi, Sadao, to Sony Corporation. Head positioning signal generating apparatus. 4,356,522, Cl. 360-77.000.

Takeda Chemical Industries, Ltd.: *See*—
Hatano, Kazunori; Nakamichi, Masanari; and Akiyama, Shun-ichi, 4,356,265, Cl. 435-119.000.

Takeda, Keiji: *See*—
Tabei, Masatoshi; Takeda, Keiji; Kawaziri, Kazuhiro; and Higashi, Akio, 4,356,246, Cl. 430-136.000.

Takeda, Shigekazu. Magnetic cards and method of manufacturing the same. 4,356,391, Cl. 235-493.000.

Takematsu, Yoshiyuki, to Fuji Koeki Corporation. Electric flash device. 4,356,533, Cl. 362-17.000.

Takemura, Eiichiro: *See*—
Furuya, Hiroshi; Okada, Munehisa; Takemura, Eiichiro; and Sato, Hideyo, 4,355,756, Cl. 229-4.500.

Takezono, Tetsuya: *See*—
Imaizumi, Masao; Takezono, Tetsuya; Amari, Takaaki; and Oguchi, Yutaka, 4,356,339, Cl. 585-829.000.

Tamura, Hideyuki; and Ikeura, Kenji, to Nissan Motor Company, Limited. Fuel supply control system for an internal combustion engine of an automotive vehicle. 4,355,616, Cl. 123-440.000.

Tamura, Hideyuki: *See*—
Asano, Masaharu; Furuhashi, Shoji; and Tamura, Hideyuki, 4,355,615, Cl. 123-437.000.

Tamura, Masuhiko: *See*—
Yoshimura, Noriaki; and Tamura, Masuhiko, 4,356,333, Cl. 568-840.000.

Tamura, Sakae; Yoshida, Hiromi; Kotoh, Takehiko; and Kobayashi, Masami, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of manufacturing an electret device. 4,356,049, Cl. 156-220.000.

Tanaka, Eiichiro; Yano, Kousaku; Aoki, Yoshitaka; and Fujiwara, Shinji, to Matsushita Electric Industrial Co., Ltd. Stripe-color filter. 4,355,866, Cl. 350-164.000.

Tanaka, Hideharu; Ishijima, Koji; and Koda, Toshihide, to Mitsubishi Denki Kabushiki Kaisha. Horizontal rotary compressor with oil forced by gas discharge into crankshaft bore. 4,355,963, Cl. 418-63.000.

Tanaka, Kano: *See*—
Honda, Haruhisa; Toyono, Tsutomu; Nakamura, Shunji; Tanaka, Kano; and Kimura, Yoshimasa, 4,355,884, Cl. 355-14.0CH.

Tanaka, Kunimaro: *See*—
Ozaki, Minoru; Onishi, Ken; and Tanaka, Kunimaro, 4,356,517, Cl. 360-13.000.

Tanaka, Yoshiaki: *See*—
Kadowaki, Koju; Sarumaru, Kohei; and Tanaka, Yoshiaki, 4,356,114, Cl. 252-467.000.

Tandem Computers Incorporated: *See*—
Katzman, James A.; Bartlett, Joel F.; Bixler, Richard M.; Davidow, William H.; Despotakis, John A.; Graziano, Peter J.; Green, Michael D.; Greig, David A.; Hayashi, Steven J.; Mackie, David R.; McEvoy, Dennis L.; Treybig, James G.; and Wierenga, Steven W., 4,356,550, Cl. 364-200.000.

Tang, Ching W., to Eastman Kodak Company. Organic electroluminescent cell. 4,356,429, Cl. 313-503.000.

Tannetics, Inc.: *See*—
Whorton, Robert B., III; and Crosby, Samuel C., Jr., 4,355,735, Cl. 222-80.000.

Tarumi, Noriyoshi; Kawamoto, Kiyoaki; Ueno, Kenji; and Sakaguchi, Hirofumi, to Konishiroku Photo Industry Co., Ltd. Recording apparatus having roller type fixing device. 4,355,881, Cl. 355-3.0FU.

Tasar, Omur: *See*—
Whiteside, Arliss E.; Freedman, Morris D.; Rothschild, Alexander M.; and Tasar, Omur, 4,356,546, Cl. 364-200.000.

Tasch, Al F., Jr.; and Fu, Horng-Sen, to Texas Instruments Incorporated. Coating device with As_2-O_3-SiO_2. 4,355,454, Cl. 29-571.000.

Tasch, Al F., Jr.: *See—*
Fu, Horng-Sen; Tasch, Al F., Jr.; and Chatterjee, Pallab K., 4,356,040, Cl. 148-1.500.

Tate, Stanley L.: *See—*
Rowland, Bobby A.; Tate, Stanley L.; and Smith, Michael C., 4,356,139, Cl. 264-174.000.

Taunton, Raymond F. Universal plastic flange for connecting urinals to drain pipes. 4,355,828, Cl. 285-342.000.

Taylor, Michael J.: *See—*
Harper, William P.; and Taylor, Michael J., 4,356,366, Cl. 200-159.00B.

TDK Electronics Co., Ltd.: *See—*
Sato, Atsushi; and Tsuyuki, Hiroshi, 4,356,530, Cl. 361-321.000.

Teates, N. Grove; and Mayhall, Riley H., Jr., to Systemation Inc. Wrapping machine and method. 4,355,496, Cl. 53-587.000.

Teche, Andre: *See—*
Martel, Jacques; Tessier, Jean; and Teche, Andre, 4,356,187, Cl. 424-304.000.

Technochemie GmbH: *See—*
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Technofast, Inc.: *See—*
Gutshall, Charles E., 4,355,552, Cl. 81-460.000.

Teepak, Inc.: *See—*
Wright, Norbert L.; and Hahn, Wayne L., 4,355,437, Cl. 17-42.000.

Teijin Limited: *See—*
Kumakawa, Shiro; and Kuroda, Toshimasa, 4,356,234, Cl. 428-372.000.
Miura, Shuzi; Yoshida, Tsunemasa; Ono, Shoji; Masuho, Yasuhiko; and Sawada, Shuzo, 4,356,173, Cl. 424-101.000.
Tajiri, Koji; Oohara, Mikio; and Maruo, Kiyoshi, 4,355,592, Cl. 112-410.000.

Telecommunications Radioelectriques et Telephoniques T.R.T.: *See—*
Ferrieu, Gilbert M. M., 4,356,354, Cl. 179-16.0AA.
Ferrieu, Gilbert M. M.; Osmond, Etienne J. R.; and Hetet, Yves J. F., 4,356,355, Cl. 179-18.0HB.

Teledyne Industries, Inc., Geotech Division: *See—*
Gudzin, Martin G., 4,356,423, Cl. 310-338.000.

Temple, Harold E.: *See—*
Berkman, Samuel; Duffy, Michael T.; and Temple, Harold E., 4,356,152, Cl. 422-248.000.

Templin, Frank C.: *See—*
Skerlos, Peter C.; Snopko, Paul A.; Templin, Frank C.; and Zato, Thomas J., 4,356,509, Cl. 358-85.000.

Tennant Company: *See—*
Kimzey, Paul W.; and Super, Daniel J., 4,355,435, Cl. 15-347.000.

Tenold, Gregory G.: *See—*
Warren, Kenneth D.; and Tenold, Gregory G., 4,355,769, Cl. 241-300.000.

Terakura, Yukio: *See—*
Ikemoto, Kazuhito; Katayama, Nobuaki; Terakura, Yukio; and Sasaki, Kan, 4,355,543, Cl. 74-473.00P.

Teranishi, Haruo: *See—*
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Terbrack, William H.: *See—*
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Tesch A.G.: *See—*
Tesch, Bernhard, 4,355,501, Cl. 59-82.000.

Tesch, Bernhard, to Zwyro A.G.; and Tesch A.G. Expansion band, such as a watch band, jewelry band or the like. 4,355,501, Cl. 59-82.000.

Tesch, Rodney C.: *See—*
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Tesmann, Holger: *See—*
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Tessier, Jean: *See—*
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Texaco inc.: *See—*
Cuscurida, Michael; and Speranza, George P., 4,356,330, Cl. 568-756.000.
Knifton, John F., 4,356,327, Cl. 568-387.000.
Knifton, John F., 4,356,332, Cl. 568-852.000.
Sweeney, William M.; and Herbstman, Sheldon, 4,356,001, Cl. 44-56.000.

Texas Instruments Incorporated: *See—*
Fu, Horng-Sen; Tasch, Al F., Jr.; and Chatterjee, Pallab K., 4,356,040, Cl. 148-1.500.
Tasch, Al F., Jr.; and Fu, Horng-Sen, 4,355,454, Cl. 29-571.000.

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Ohlsson, Jarl-Erik S. I., 4,355,576, Cl. 101-426.000.

Textile Products, Incorporated: *See—*
Curzio, Frederick H., 4,355,668, Cl. 139-420.00R.

Textile Technology, Inc.: *See—*
Vinas, Juan, 4,355,747, Cl. 226-34.000.

Thermwood Corporation: *See—*
Susnjara, Kenneth J.; and Diamond, Michael N., 4,356,554, Cl. 364-513.000.

Theurer, Josef, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Track tamper. 4,355,579, Cl. 104-12.000.

Theurer, Josef; and Folser, Karl, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Ballast leveling apparatus and method. 4,355,687, Cl. 171-16.000.

Thibaut, Jules: *See—*
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Thielmann, Joachim: *See—*
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Thomas & Betts Corporation: *See—*
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Thomas, Gerald S.: *See—*
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Thomas, Leslie P.; and Bliss, George N., to Diamond International Corporation. Egg transfer apparatus. 4,355,936, Cl. 414-118.000.

Thomas, Marvin C. Retractable device and method for providing traction. 4,355,451, Cl. 29-426.600.

Thomas, Paul L., to Hewlett-Packard Company. Logarithmic attenuating circuit. 4,356,449, Cl. 328-145.000.

Thompson, Robert A.: *See—*
Komanduri, Ranga; Lee, Minyoung; Flom, Donald G.; Thompson, Robert A.; Jones, Marshall G.; and Douglas, Robert J., 4,356,376, Cl. 219-121.0LN.

Thomsen, Ove; and Ronnow, Peter, to A-Betone AB. Plant for the production of methane. 4,356,269, Cl. 435-316.000.

Thomsen, Timothy A., to University of Iowa Research Foundation. Adjustable weight lifting holding device for leg lifting exercises. 4,355,801, Cl. 272-119.000.

Thomson-CSF: *See—*
Cornette, Andre; and Rey, Georges, 4,356,056, Cl. 156-649.000.
Dudome, Michel, 4,356,497, Cl. 343-854.000.
Gonin, Roger B.; Forster, Daniel; and Picquendar, Jean E., 4,356,463, Cl. 333-165.000.

Thornton, Arthur G. Sign construction having selectively displayable directional signals and improved mounting bracket. 4,355,479, Cl. 40-570.000.

Thrash, Tommy: *See—*
Cowan, Jack C.; Thrash, Tommy; and Rayborn, Jerry R., 4,356,096, Cl. 252-8.50C.

Tilman, Paul A., to Minigrip, Inc. Reclosable bags, apparatus and method. 4,355,494, Cl. 53-416.000.

Timex Corporation: *See—*
Hsu, Ying Y., 4,356,104, Cl. 252-299.610.

Tindall, Donald J.; and Means, Anthony R., to Upjohn Company, The. 17β-Hydroxy-17α-methyl-5α-androstano-[3,2-c]pyrazole 17-methyl ether. 4,356,175, Cl. 424-241.000.

Tischer, Werner: *See—*
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TMC Corporation: *See—*
Krob, Erwin; and Weigl, Erwin, 4,355,817, Cl. 280-605.000.

Todd, John M., to General Foods Inc. Wrap food coating mix and method of using. 4,356,202, Cl. 426-138.000.

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Togawa, Yasuhito: *See—*
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Tohoku Metal Industries, Ltd.: *See—*
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Tohoku Ricoh Co. Ltd.: *See—*
Ikenoue, Tsuneo; Liu, Shin-yng; Umemoto, Shuichi; and Arai, Naoki, 4,356,541, Cl. 363-20.000.

Tokico Kabushiki Kaisha: *See—*
Ikeda, Jun-ichi; and Hasegawa, Yasuo, 4,355,532, Cl. 73-11.000.

Tokico Ltd.: *See—*
Saito, Kazuo, 4,355,707, Cl. 188-73.320.

Toko Kabushiki Kaisha: *See—*
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Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Hirose, Minoru, 4,355,711, Cl. 194-4.00C.
Masuda, Eiji, 4,356,450, Cl. 330-9.000.
Noguchi, Mikio; and Kobayashi, Kazuho, 4,356,427, Cl. 313-422.000.
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Toray Industries, Incorporated: *See—*
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Matsumoto, Tadayuki; Imaeda, Kozo; Mineo, Masatoshi; and Nakagawa, Kiyoshi, 4,355,445, Cl. 28-274.000.
Torii, Soichi, to Torii Winding Machine Co., Ltd. Shuttle propelling mechanism in circular loom. 4,355,666, Cl. 139-13.00R.
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Torrenteras, Angel E.; and Torrenteras, Antonio E. Apparatus for automatically boxing cylindrical goods. 4,355,492, Cl. 53-58.000.
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Tosato, Lawrence P.; and Mullis, Clyde M., to Westinghouse Electric Corp. Electrically driven sheave. 4,355,785, Cl. 254-362.000.
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Leskovec, Edward V., 4,355,695, Cl. 180-68.500.
Wiblin, Wayne T., 4,355,947, Cl. 414-785.000.
Toyo Kogyo Co., Ltd.: *See*—
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Toyoda Gosei Co., Ltd.: *See*—
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Toyota Jidosha Kabushiki Kaisha: *See*—
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Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
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Hayashi, Kunihisa; and Moriyama, Masakazu, 4,355,614, Cl. 123-436.000.
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Iwase, Kazuo; Kawai, Hisasi; Yoshimura, Kunimasa; Ito, Toshimitsu; and Ito, Yoshiyasu, 4,356,551, Cl. 364-431.080.
Kitagawa, Naoto; Masaki, Kunihiko; and Watanabe, Hiroyuki, 4,355,820, Cl. 280-779.000.
Okano, Hiroshi, 4,355,850, Cl. 308-9.000.
Tozun, Orhan N., to International Microcircuits, Inc. MOS Integrated circuit structure for discretionary interconnection. 4,356,504, Cl. 357-42.000.
Trachsler, Dieter; and Lohse, Friedrich, to Ciba-Geigy Corporation. Process for the production of N-cyanolactams. 4,356,121, Cl. 260-239.30R.
Tran, Nhan V., to Marine Construction & Design Co. Flow-through oil/water separation filter. 4,356,090, Cl. 210-350.000.
Transcan Video Limited: *See*—
Armstrong, Andrew S.; and Sach, Martin R., 4,356,514, Cl. 358-214.000.
TransData, Inc.: *See*—
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Traub, Alan C.: *See*—
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Treybig, James G.: *See*—
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Trimble, Donald B.: *See*—
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Trippel, Gerhard: *See*—
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Trumbull, Walter A.: *See*—
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Tsai, Yun-Ting. Refrigerator-oven complex. 4,355,521, Cl. 62-196.00B.
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Tsubota, Naoki; and Shibuya, Satoru, to Giken Trading Co., Ltd. Apparatus for counting the number of objects passing a given point. 4,356,387, Cl. 235-92.0PK.
Tsuchiya, Mitsuharu: *See*—
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Tsuda, Hiroshi: *See*—
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Tsujimura, Katsuhito, to Sony Corporation. Digital soft-edge video special effects generator. 4,356,511, Cl. 358-181.000.
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Tsutsumi, Yoshio; and Takahashi, Tomoyuki, to Kabushiki Kaisha Komatsu Seisakusho. Scavenging pump. 4,355,542, Cl. 74-467.000.
Tsuyuki, Hiroshi: *See*—
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Tsuzuki, Akira: *See*—
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Tucker, Fred E., III: *See*—
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Tune, John B.: *See*—
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Tyminski, Patricia N.: *See*—
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Ueno, Kenji: *See*—
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Ullrich, Manfred F., to ITT Industries, Inc. Input circuit for bucket brigade. 4,356,407, Cl. 307-221.00D.
Ulsky, Carl M., to KACA Corporation. Vehicle tire rim core remover. 4,355,556, Cl. 83-124.000.
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Union Carbide Corporation: *See*—
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Chiu, Herman S.; and Watts, Keith A., 4,356,218, Cl. 427-355.000.
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United Kingdom Atomic Energy Authority: *See*—
Woodhead, James L.; and Raw, Graham, 4,356,106, Cl. 252-313.00R.
U.S. Foam Mfg. Co., Inc.: *See*—
Blenke, Joseph F.; and Blenke, Stanley J., Sr., 4,355,508, Cl. 60-416.000.
U.S. Industries, Inc.: *See*—
Snyder, David E., 4,355,658, Cl. 137-557.000.
United States of America
Agriculture: *See*—
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Air Force: *See*—
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Baucom, Keith B., 4,356,070. Cl. 204-158.00R.
Kuperman, Gilbert G.; and Hann, Reuben L., 4,355,981, Cl. 434-14.000.
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Nussmeier, Thomas A., 4,355,900, Cl. 356-356.000.
Sankaran, Venkatesa; and Marvel, Carl S., 4,356,292, Cl. 525-419.000.
Army: *See*—
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Energy: *See*—
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National Aeronautics and Space Administration; administrator; with respect to an invention of:
Laue, Eric G. Cloud cover sensor. 4,355,896, Cl. 356-222.000.
Orloff, Kenneth L.; and Yanagita, Haruo. Rhomboid prism pair for rotating the plane of parallel light beams. 4,355,870, Cl. 350-486.000.
National Aeronautics and Space Administration: *See*—
Altman, Robert L., 4,356,157, Cl. 423-419.00P.
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Griffith, James R.; and O'Rear, Jacques G., 4,356,296, Cl. 526-242.000.
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Sewell, Robert G. S.; Pringle, John K.; Backman, Marvin E.; and Finnegan, Stephen A., 4,355,562, Cl. 89-36.00A.
Stachiw, Jerry D., 4,355,867, Cl. 350-319.000.

U.S. Philips Corporation: *See*—
Barten, Piet G. J.; and Bos, Johannes J., 4,356,436, Cl. 315-386.000.
Bergsma, Wijtse, 4,355,464, Cl. 30-34.100.
Robers, Klaas H. J., 4,356,512, Cl. 358-183.000.
Rousseau, Jean-Pierre, 4,355,921, Cl. 403-316.000.
van Laar, Jan, 4,356,468, Cl. 336-69.000.
van Maanen, Gerardus A., 4,356,422, Cl. 310-322.000.
Wittekoek, Stefan; and Fahner, Theodorus A., 4,356,392, Cl. 250-201.000.

United Technologies Corporation: *See*—
Kalmanash, Michael H., 4,356,435, Cl. 315-375.000.
Sifford, Perry P.; and Griffin, Jerry H., 4,355,957, Cl. 416-145.000.

University of Iowa Research Foundation: *See*—
Laughlin, Donald; and Krumm, Paul J., 4,355,643, Cl. 128-663.000.
Thomsen, Timothy A., 4,355,801, Cl. 272-119.000.

University of Minnesota, The Regents of the: *See*—
Liu, Benjamin Y. H.; Kittelson, David B.; Dolan, Daniel F.; and Pui, David Y. H., 4,355,504, Cl. 60-275.000.

University of Utah: *See*—
Peterson, Robert V.; Anderson, James M.; Gregonis, Donald E.; Kim, Sunj-Wan; and Feijen, Jan, 4,356,166, Cl. 424-19.000.

Unkle, Truman F.: *See*—
Cheung, Ki C.; Unkle, Truman F.; Schwartz, Arnold A.; and Hsieh, Raymond J., 4,356,144, Cl. 376-203.000.

Uno, Hitoshi; Kurokawa, Mikio; and Nakamura, Hideo, to Dainippon Pharmaceutical Co., Ltd. Acetic acid derivatives and composition containing the same. 4,356,186, Cl. 424-275.000.

UOP Inc.: *See*—
Imai, Tamotsu, 4,356,334, Cl. 568-909.000.

Upjohn Company, The: *See*—
DeGeeter, Melvin J., 4,356,191, Cl. 424-321.000.
DeGeeter, Melvin J., 4,356,192, Cl. 424-326.000.
DeGeeter, Melvin J., 4,356,193, Cl. 424-326.000.
DeGeeter, Melvin J., 4,356,194, Cl. 424-326.000.
Tindall, Donald J.; and Means, Anthony R., 4,356,175, Cl. 424-241.000.

Urasaki, Shuji: *See*—
Katagi, Takashi; Urasaki, Shuji; Ebisui, Takashi; and Aoki, Katsuhiko, 4,356,494, Cl. 343-781.0CA.

USM Corporation: *See*—
Skierski, Edwin J., 4,355,430, Cl. 10-9.000.

Usui, Tugumoto; Kato, Katsunori; and Kojima, Tamotsu, to Konishiroku Photo Industry Co., Ltd. Silver halide color photographic material containing yellow coupler. 4,356,258, Cl. 430-557.000.

Uya, Masaru; and Kawamoto, Kinji, to Matsushita Electric Industrial Co. Ltd. Electronic musical instrument. 4,355,559, Cl. 84-1.030.

Uzunoglu, Vasil, to Communications Satellite Corporation. Division by noninteger numbers using synchronous oscillators. 4,356,456, Cl. 331-117.00R.

Vacuumatic Limited: *See*—
Day, George W., 4,355,796, Cl. 271-20.000.

Van Brocklin, Lester P.: *See*—
Carron, Mark S.; La Barbera, Ronald S.; Van Brocklin, Lester P.; and Jain, Pawan K., 4,356,130, Cl. 260-989.000.

Vandebult, Jan. FM/AM Electronic security system. 4,356,477, Cl. 340-572.000.

vander Have, Leonard A., to Combustion Engineering, Inc. Temperature compensation for transducer components. 4,355,537, Cl. 73-708.000.

Vander Meulen, Edward F.: *See*—
Zans, William A.; and Vander Meulen, Edward F., 4,355,928, Cl. 406-90.000.

van Laar, Jan, to U.S. Philips Corporation. Transformer with magnetic screening foils. 4,356,468, Cl. 336-69.000.

van Maanen, Gerardus A., to U.S. Philips Corporation. Acoustic transducer. 4,356,422, Cl. 310-322.000.

Van Rhyn, Lucas H.: *See*—
Inscho, Howard P.; and Van Rhyn, Lucas H., 4,356,372, Cl. 219-60.00R.

Van Vliet, Marius, to Design Research Marketing (Proprietary) Limited. Space frame connectors. 4,355,918, Cl. 403-170.000.

Vapor Corporation: *See*—
Reip, Raymond G., 4,355,657, Cl. 137-492.000.

Varga, Tivadar: *See*—
Szendrodi, Valer; Radics, Gyula; Varga, Tivadar; Vass, Tibor; and Gyurics, Karoly, 4,355,840, Cl. 296-179.000.

Varian Associates, Inc.: *See*—
Borden, Peter G.; and Saxena, Ram R., 4,356,341, Cl. 136-249.000.
Stone, David S.; and Shively, James F., 4,356,430, Cl. 315-4.000.

Vass, Tibor: *See*—
Szendrodi, Valer; Radics, Gyula; Varga, Tivadar; Vass, Tibor; and Gyurics, Karoly, 4,355,840, Cl. 296-179.000.

Vaughan, Roger, to Imperial Group Limited. Apparatus for automatically measuring the properties of air-permeable rod-like articles. 4,355,535, Cl. 73-37.800.

Veb Arzneimittelwerk Dresden: *See*—
Lehmann, Dieter; Femmer, Klaus; and Faust, Gottfried, 4,356,322, Cl. 564-185.000.

Veb Werk fur Fernschelektronik: *See*—
Schubert, Herrmann; Pelzl, Gerhard; Zaschke, Horst; Demus, Dietrich; Nothni, Hans-Ulrich; and Kuschel, Frank, 4,356,103, Cl. 252-299.100.

Velisek, Frank J.: *See*—
Anthony, John; Velisek, Frank J.; and Capponi, Paul D., 4,356,221, Cl. 428-35.000.

Venture Chemicals, Inc.: *See*—
Cowan, Jack C.; Thrash, Tommy; and Rayborn, Jerry R., 4,356,096, Cl. 252-8.50C.

Verbeek, Antonie E.; and Mattheij, Jozef M. J., to J. T. Baker Chemicals B.V. Reagent for the quantitative determination of water and its use therefor. 4,355,998, Cl. 23-230.00R.

Verdino, Heiner: *See*—
Daimer, Wolfgang; and Verdino, Heiner, 4,356,278, Cl. 523-414.000.

Verein zur Forderung der Giesserei-Industrie: *See*—
Orths, Kurt; Lampic, Milan; Berger, Peter; Muller, Jorg; and Loblich, Herbert, 4,355,907, Cl. 374-26.000.

Verne, Stefan, to BICC Limited. Fully-filled telecommunication cables. 4,356,342, Cl. 174-23.00C.

Viale, Ernesto, to CSELT - Centro Studi e Laboratori Telecomunicazioni S.P.A. Automatic digital telephone exchange. 4,356,563, Cl. 370-58.000.

Vianova Kunstharz, A.G.: *See*—
Daimer, Wolfgang; and Verdino, Heiner, 4,356,278, Cl. 523-414.000.
Honig, Helmut; Leitner, Wolfgang; and Pampouchidis, Georg, 4,356,276, Cl. 523-404.000.

Vierkotter, Peter, to Henkel Kommanditgesellschaft auf Aktien. Liquid storage container. 4,355,739, Cl. 222-134.000.

Viguie, Jean-Claude: *See*—
Francois, Bernard; and Viguie, Jean-Claude, 4,356,135, Cl. 264-61.000.

Villa, Francisco, to CGR Compania Generale de Radiologia. Film feed magazine for equipping a radiographic film changer and a film-changer equipped with said magazine. 4,355,798, Cl. 271-21.000.

Vinarub, Edmond I., to Exxon Research and Engineering Co. Solid state power switch for gas discharge lamps. 4,356,432, Cl. 315-287.000.

Vinas, Juan, to Textile Technology, Inc. Multi-purpose yarn feeding device. 4,355,747, Cl. 226-34.000.

Volz, Jack H., to AMF Incorporated. Pull-to-turn switch. 4,356,360, Cl. 200-11.00R.

Von Braun, Daun W. Containment skirt for drilling fluid. 4,355,826, Cl. 285-45.000.

Voyer, Joseph L.: *See*—
Bruckner, Ronald L.; Khamare, Ishwar S.; Voyer, Joseph L.; Hamilton, Rodney V.; and Gheorghiu, Paul, 4,356,542, Cl. 363-26.000.

VSI Corporation: *See*—
Floyd, James K., 4,355,662, Cl. 138-30.000.

W. E. Healey & Associates, Inc.: *See*—
Healey, William E.; and Heineman, Morse R., 4,356,476, Cl. 340-522.000.

Wacker-Chemie GmbH: *See*—
Deubzer, Bernward; Egerter, Norbert; Frey, Volker; and Leitner, Kurt, 4,356,293, Cl. 525-477.000.

Wada, Ryoichi; Seno, Takanori; and Tsuchiya, Mitsuharu, to Matsushita Electric Industrial Co., Ltd. Synchronizing signal detecting apparatus. 4,356,566, Cl. 375-116.000.

Wagner, Kuno; Dahm, Manfred; and Muller, Hanns P., to Bayer Aktiengesellschaft. Aminoplast foams. 4,356,275, Cl. 521-136.000.

Wagner, Mary H. Loading device and loading method for horse trailers and the like. 4,355,594, Cl. 119-7.000.

Wagner, Rudolf: *See*—
Kleemann, Axel; Nygren, Robert; and Wagner, Rudolf, 4,356,323, Cl. 564-475.000.

Waite, Frederick A.: *See*—
Brooks, Herbert; and Waite, Frederick A., 4,356,003, Cl. 44-62.000.

Waller, Francis J., to Du Pont de Nemours, E. I., and Company. Toluic acid. 4,356,318, Cl. 562-406.000.

Wallin, Gus W.: *See*—
Flaherty, John J., Jr.; and Wallin, Gus W., 4,356,381, Cl. 219-283.000.

Walsworth, Frank J.: *See*—
Borst, Gaylord M.; and Walsworth, Frank J., 4,355,985, Cl. 440-51.000.

Walter, Wolfgang: *See*—
Lepere, Henri G.; and Walter, Wolfgang, 4,355,490, Cl. 51-419.000.

Walters, Dwight E.: *See*—
Smith, Robert F.; and Walters, Dwight E., 4,355,997, Cl. 23-230.0EP.

Walther, Ludwig: *See*—
Hannes, Heinz D.; Lothmann, Josef; and Walther, Ludwig, 4,355,787, Cl. 266-92.000.

Wang, Donald G.: *See*—
Kavesh, Sheldon; Prevorsek, Dusan C.; and Wang, Donald G., 4,356,138, Cl. 264-164.000.

Ware Machine Service, Inc.: *See*—
Pilch, John S., 4,355,945, Cl. 414-686.000.

Wargin, Robert V.: *See*—
Guzy, Raymond L.; and Wargin, Robert V., 4,356,137, Cl. 264-137.000.

Warren Automatic Tool Company: *See*—
Cain, Lester L., 4,355,784, Cl. 251-63.000.

Warren, Kenneth D.; and Tenold, Gregory G., to Spokane Crusher Mfg. Co. Impeller shoe assembly. 4,355,769, Cl. 241-300.000.

Warwick Chemical Limited: *See—*
Hannam, Stephen J., 4,356,321, Cl. 564-144.000.

Watanabe, Hiroshi: *See—*
Shimizu, Hiroshi; and Watanabe, Hiroshi, 4,356,421, Cl. 310-320.000.

Watanabe, Hiroyuki: *See—*
Kitagawa, Naoto; Masaki, Kunihiko; and Watanabe, Hiroyuki, 4,355,820, Cl. 280-779.000.

Watanabe, Katsunori: *See—*
Ishikawa, Shozo; Katagiri, Kazuharu; Watanabe, Katsunori; Ohta, Shigeto; and Kitahara, Makoto, 4,356,243, Cl. 430-58.000.

Watanabe, Masaru: *See—*
Makino, Kenya; Sakurai, Hieo; Watanabe, Masaru; and Nishimura, Toshiyuki, 4,356,160, Cl. 423-492.000.

Watanabe, Seizo, to Olympus Optical Company Ltd. Magnetic head. 4,356,524, Cl. 360-129.000.

Watanabe, Seizo: *See—*
Saitou, Sinichi; Kato, Toshikazu; Kimura, Kenji; Satoh, Ken; Shibata, Tsutomu; Watanabe, Seizo; and Ohshima, Ken, 4,355,750, Cl. 226-188.000.

Watanabe, Takeaki, to Nissan Motor Co., Ltd. Air heating system of internal combustion engine-mounted motor vehicle. 4,355,753, Cl. 237-12.30A.

Watts, Keith A.: *See—*
Chiu, Herman S.; and Watts, Keith A., 4,356,218, Cl. 427-355.000.

Watts, Ralph M., to Lowery, John W. Illuminated solar energy collector. 4,355,628, Cl. 126-427.000.

Watts, Ronald C. Fisherman's cart. 4,355,818, Cl. 280-654.000.

Wean United, Inc.: *See—*
Miles, John H., 4,355,526, Cl. 72-164.000.

Weaver, Ralph J., III: *See—*
Shefler, Gerald E.; and Weaver, Ralph J., III, 4,356,351, Cl. 179-1.00B.

Weber, Joseph; and Weber, Maria L. Record indexing system. 4,355,824, Cl. 283-21.000.

Weber, Maria L.: *See—*
Weber, Joseph; and Weber, Maria L., 4,355,824, Cl. 283-21.000.

Weber, Robert: *See—*
Krauss, Peter; Muller, Ewald; Porner, Horst; and Weber, Robert, 4,355,790, Cl. 266-252.000.

Wedge, Richard. Drafting aid. 4,355,472, Cl. 33-486.000.

Weigl, Erwin: *See—*
Krob, Erwin; and Weigl, Erwin, 4,355,817, Cl. 280-605.000.

Weiler, Peter M.: *See—*
Hinds, Sally K.; Weiler, Peter M.; and Hewitt, Robert R., 4,355,719, Cl. 206-334.000.

Weinlich, Jurgen; Plewan, Otto; Leugering, Hans-Joachim, deceased; by Leugering nee Wegener, Ursula M., heiress; by Leugering, Lothar, heir; by Leugering, Manfred, heir; by Bahn nee Leugering, Rita, heiress; and by Leugering, Gunter, heir, to Hoechst Aktiengesellschaft. Vinyl chloride polymer mixtures for processing as plastisols or organosols. 4,356,283, Cl. 524-504.000.

Weischedel, Richard C., to General Electric Company. Voltage controlled non-saturating semiconductor switch and voltage converter circuit employing same. 4,356,416, Cl. 307-570.000.

Weissberger, Edward: *See—*
Abel, Edward P.; and Weissberger, Edward, 4,356,249, Cl. 430-215.000.

Weisser, Gunter; Starkloff, Bernd; and Stoesser, Klaus, to Battelle-Institut e.V. Device for measuring the mass flow and the heat flow and method for determining the mass flow. 4,355,908, Cl. 374-39.000.

Weissman, Bernard, to Ipco Corporation. Lingual dental splint device. 4,355,979, Cl. 433-225.000.

Welch, Richard M.: *See—*
Findlay, John W. A.; Butz, Robert F.; and Welch, Richard M., 4,356,165, Cl. 424-1.000.

Welch, William A.: *See—*
Fickes, Scott A.; and Welch, William A., 4,355,599, Cl. 119-106.000.

Wells, Rodney L.; Rowe, Monty L.; Yates, Samuel L.; and Muller, George R., to Allied Corporation. Additive dispersions and process for their incorporation with fiber-forming polymers. 4,356,280, Cl. 524-148.000.

Wepner, Roy H.: *See—*
Hofberg Robert; Goldstein, Bonnie D.; and Wepner, Roy H., 4,355,720, Cl. 206-460.000.

West, Kenneth J., to Data General Corporation. Apparatus for monitoring and/or controlling the operations of a computer from a remote location. 4,356,545, Cl. 364-200.000.

Westinghouse Electric Corp.: *See—*
Brown, David L.; and Miller, Victor D., Jr., 4,355,952, Cl. 415-115.000.
Cohen, Albert; Brown, Ralph D.; and Scott, William D., 4,355,515, Cl. 60-657.000.
Down, Michael G.; Heberlein, Joachim V. R.; and Meyer, Thomas N., 4,356,029, Cl. 75-0.50B.
Emery, Franklin T., 4,356,443, Cl. 324-51.000.
Feilchenfeld, Michal M., 4,356,390, Cl. 235-455.000.
Gainer, Gordon C.; and Luck, Russell M., 4,355,960, Cl. 417-419.000.
Jackovitz, John F.; Seidel, Joseph; and Pantier, Earl A., 4,356,101, Cl. 252-182.100.
Kemeny, George A.; and Barber, John P., 4,355,561, Cl. 89-8.000.
Lenderking, Bruce N.; and Garrett, Donald P., 4,356,397, Cl. 250-231.0SE.
McShane, James L.; Golick, Leonard R.; and Spiegelman, Stanley R., 4,355,536, Cl. 73-633.000.
Sherwood, Edward F., 4,355,486, Cl. 49-409.000.
Smith, James D. B.; and Kauffman, Robert N., 4,356,417, Cl. 310-43.000.
Sprengling, Gerhard R.; and Cargnel, Louis A., 4,356,237, Cl. 428-404.000.
Tosato, Lawrence P.; and Mullis, Clyde M., 4,355,785, Cl. 254-362.000.

Westlake, E. B., Jr.: *See—*
Sweeney, Edward E.; and Magowan, Paul N., 4,355,966, Cl. 425-140.000.

Westvaco Corporation: *See—*
Dilling, Peter; and Prazak, Gerald, 4,355,996, Cl. 8-561.000.

Wetmore, Halsey J., to Adams Hard-Facing Company, Inc. Fertilizer applicator knife assembly. 4,355,589, Cl. 111-7.000.

Wheaton Industries: *See—*
Germanio, Louis, 4,356,142, Cl. 264-537.000.

White, Dwain M., to General Electric Company. Block polymers of polyphenylene oxide and aromatic polyformals. 4,356,290, Cl. 525-397.000.

White, Eugene B., Jr., to White Machinery Corporation. Retractable wheeled vehicle. 4,355,584, Cl. 105-215.00C.

White, Lawrence J.: *See—*
Cook, Paul M.; Otte, Richard F.; Claypool, James L.; White, Lawrence J.; Broyles, Harry C.; and Brooks, Peter L., 4,355,664, Cl. 138-110.000.

White Machinery Corporation: *See—*
White, Eugene B., Jr., 4,355,584, Cl. 105-215.00C.

Whiteside, Arliss E.; Freedman, Morris D.; Rothschild, Alexander M.; and Tasar, Omur, to Bendix Corporation, The. Fault-tolerant multicomputer system. 4,356,546, Cl. 364-200.000.

Whorton, Robert B., III; and Crosby, Samuel C., Jr., to Tannetics, Inc. Valving mechanism for beverage dispensing device. 4,355,735, Cl. 222-80.000.

Wiblin, Wayne T., to Towmotor Corporation. Hook-type carriage plate with floating forks. 4,355,947, Cl. 414-785.000.

Wicnienski, Michael F.: *See—*
Cobean, Richard W.; Wicnienski, Michael F.; and Feldman, Gary, 4,356,394, Cl. 250-222.00R.

Wiedmer, Ernest: *See—*
Wiedmer, Walter, 4,355,730, Cl. 215-253.000.

Wiedmer, Walter, to Wiedmer, Ernest. Screw cap with a guarantee ring for indicating the first opening of a container. 4,355,730, Cl. 215-253.000.

Wieduwilt, Leslie R., Jr.: *See—*
Scholz, Ray J.; Southern, William C.; and Wieduwilt, Leslie R., Jr., 4,355,782, Cl. 249-93.000.

Wiener, Patricia P., to Xerox Corporation. Integrated stylus array for printer operation. 4,356,347, Cl. 178-30.000.

Wierenga, Steven W.: *See—*
Katzman, James A.; Bartlett, Joel F.; Bixler, Richard M.; Davidow, William H.; Despotakis, John A.; Graziano, Peter J.; Green, Michael D.; Greig, David A.; Hayashi, Steven J.; Mackie, David R.; McEvoy, Dennis L.; Treybig, James G.; and Wierenga, Steven W., 4,356,550, Cl. 364-200.000.

Wiessner, Edgar: *See—*
Harbauer, Werner; and Wiessner, Edgar, 4,356,363, Cl. 200-50.00C.

Wiezer, Hartmut; Nowy, Gunther; and Haberlein, Harald, to Hoechst Aktiengesellschaft. Process for the preparation of 2,2,6,6-tetramethylpiperidone-4. 4,356,308, Cl. 546-242.000.

Wigand, Gerhard. Device for the destruction of microfilm and similar data carriers. 4,355,766, Cl. 241-222.000.

Wiley, Jack C.: *See—*
Orlandea. Nicolae V.; and Wiley, Jack C., 4,355,697, Cl. 180-261.000.

Wilkins, Rennie F. T., to British Aluminum Company Limited. Casting metals. 4,355,679, Cl. 164-466.000.

Wilkinson, John R., to Bendix Corporation, The. Fast response two coil solenoid driver. 4,355,619, Cl. 123-490.000.

Will, Gerhard; Stroh, Walter; and Zechnall, Martin, to Robert Bosch GmbH. Torque control for internal combustion engines. 4,355,550, Cl. 74-872.000.

Willenbring, Armer J., to Pako Corporation. Film advance breakaway mechanism for slide mounter. 4,355,748, Cl. 226-67.000.

Williams, David W.; Jordan, James L.; and Huntsinger, James E., to F. Korbel and Bros. Method and apparatus for riddling bottled wines in cases. 4,356,208, Cl. 426-592.000.

Williams, Donald E.: *See—*
Elford, William J.; Williams, Donald E.; and Miller, Keith H., 4,356,045, Cl. 156-64.000.

Williams, Louis E., Sr. Automatic golf ball teeing apparatus. 4,355,811, Cl. 273-201.000.

Williams, Robert A. Self-locking means. 4,355,854, Cl. 339-89.00R.

Williams, Thomas A.: *See—*
Rosenbluth, William; and Williams, Thomas A., 4,356,413, Cl. 307-443.000.

Wilson, Alexander J., to Lucas Industries Limited. Hydraulically operated anti-skid braking systems for vehicles. 4,355,849, Cl. 303-116.000.

Wilson, Harold E. Active band pass filter. 4,356,451, Cl. 330-107.000.

Wilson, James D., to Maytag Company, The. Pump impeller. 4,355,954, Cl. 415-213.00B.

Wilson, Reginald D. Enuresis detector and alarm. 4,356,479, Cl. 340-604.000.

Winkler, Bruno, to Naturin-Werk Becker & Co. Edible wreath-shaped food casings, especially sausage casings. 4,356,201, Cl. 426-138.000.
Winterton, Neil: *See*—
Bain, David; Martin, John E.; Saul, John H.; and Winterton, Neil, 4,356,038, Cl. 134-2.000.
Wittekoek, Stefan; and Fahner, Theodorus A., to U.S. Philips Corporation. Optical imaging system provided with an opto-electronic detection system for determining a deviation between the image plane of the imaging system and a second plane on which an image is to be formed. 4,356,392, Cl. 250-201.000.
Wittenzellner, Ernst: *See*—
Guntner, Helmut; and Wittenzellner, Ernst, 4,356,414, Cl. 307-455.000.
Wlochowski, Jan M.: *See*—
Perez, Steven R.; Horton, Philip G.; and Wlochowski, Jan M., 4,355,886, Cl. 355-15.000.
Woebcke, Herman N.; Bhojwani, Arju H.; and Gartside, Robert J., to Stone & Webster Engineering Corp. Solids quench boiler. 4,356,151, Cl. 422-145.000.
Wojtowicz, John A.; and Hooks, Haywood, Jr., to Olin Corporation. Single step process for cyanuric acid. 4,356,303, Cl. 544-192.000.
Wolf, David, to Scott's Liquid Gold, Inc. Container holder and actuator for aerosol cans. 4,355,740, Cl. 222-180.000.
Wolf, Elmar: *See*—
Kelkenberg, Heike; and Wolf, Elmar, 4,356,307, Cl. 546-200.000.
Wolfson, Ronald I.; and Cho, Ching-Fai. Loop-coupler commutating feed for scanning a circular array antenna. 4,356,496, Cl. 343-854.000.
Wollam, Carl A.; Gailey, J. Lynn; and Chalmers, Alexander A., to Alcan Aluminum Corporation. Process for producing striated surface coatings. 4,356,217, Cl. 427-286.000.
Wollam, Carl A.: *See*—
Gailey, J. Lynn; and Wollam, Carl A., 4,356,216, Cl. 427-286.000.
Wolley, E. Duane: *See*—
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Wood, Ralph T.: *See*—
Keramati, Bahram; Bray, Steven C.; and Wood, Ralph T., 4,356,382, Cl. 219-297.000.
Woodhead, James L.; and Raw, Graham, to United Kingdom Atomic Energy Authority. Cerium compounds. 4,356,106, Cl. 252-313.00R.
Wooding, Joseph F.: *See*—
Neckermann, Edwin F.; and Wooding, Joseph F., 4,356,060, Cl. 162-181.600.
Woods, Lee O.; and Haag, Donald L., to General Electric Company. Method of making an electrical control. 4,355,458, Cl. 29-602.00R.
Wooley, Bruce A.: *See*—
Candy, James C.; and Wooley, Bruce A., 4,356,559, Cl. 364-724.000.
World Resources Company: *See*—
Halpin, Peter T.; and Zarur, George L., 4,356,030, Cl. 75-21.000.
Wright, Keith G., to Control Data Canada, Ltd. Method and apparatus for demultiplexing electrical signals. 4,356,562, Cl. 370-20.000.
Wright, Michael L.; and Hames, Michael D., to Chloride Silent Power Limited. Sodium sulphur cells. 4,356,241, Cl. 429-104.000.
Wright, Norbert L.; and Hahn, Wayne L., to Teepak, Inc. Quick change drive for shirring machine control shaft. 4,355,437, Cl. 17-42.000.
Wu, Yulin, to Phillips Petroleum Company. Low viscosity slurry and method of preparing same. 4,356,105, Cl. 252-308.000.
Wulff, Claus: *See*—
Hucks, Uwe; Tresper, Erhard; and Wulff, Claus, 4,356,129, Cl. 260-973.000.
Wulfing, Karl-Heinz; and Engelhardt, Werner, to Hacoba Textilmaschinen GmbH & Co. KG. Feeding apparatus for wet yarn. 4,355,749, Cl. 226-171.000.
Wykhuis, Lloyd A.; and O'Neill, Michael J., to Deere & Company. Lift arm and control linkage structure for loader buckets. 4,355,946, Cl. 414-707.000.
Wykoff, Carl L.: *See*—
Barnes, Charles A.; Davis, Dean E.; and Wykoff, Carl L., 4,355,698, Cl. 180-273.000.
Wyoming Mineral Corporation: *See*—
Lopez, Jose G.; and Gould, Kenneth W., 4,356,154, Cl. 423-10.000.
Xerox Corporation: *See*—
Cole, David L.; Swistak, Gregory B.; Ryon, Randall C.; Lama, William L.; and Northrup, Karl A., 4,355,891, Cl. 355-57.000.
Herloski, Robert P.; Norton, James R.; and Antos, Ronald L., 4,355,859, Cl. 350-6.100.
Koguchi, Kenji, 4,356,516, Cl. 358-288.000.
Lavallee, Pierre A.; Marshall, Sidney W.; and Antos, Ronald L., 4,355,860, Cl. 350-6.800.
Perez, Steven R.; Horton, Philip G.; and Wlochowski, Jan M., 4,355,886, Cl. 355-15.000.
Ronen, Ram S., 4,356,501, Cl. 346-155.000.
Snellling, Christopher, 4,355,882, Cl. 355-3.0BE.
Stemmle, Denis J., 4,355,880, Cl. 355-3.0SH.
Wiener, Patricia P., 4,356,347, Cl. 178-30.000.
Yamachika, Hiroshi: *See*—
Saito, Kenji; and Yamachika, Hiroshi, 4,356,326, Cl. 568-322.000.
Yamada, Tetsuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Protection circuit for a semiconductor device. 4,356,502, Cl. 357-13.000.
Yamaguchi, Nobutaka: *See*—
Tadokoro, Eiichi; Masuda, Haruo; Yamaguchi, Nobutaka; and Fujiyama, Masaaki, 4,356,232, Cl. 428-325.000.
Yamamitsu, Chojuro, to Matsushita Electric Industrial Co. Ltd. Automatic chrominance control circuit for a color video tape recorder. 4,356,506, Cl. 358-316.000.
Yamamoto, Katsumi: *See*—
Kagawa, Naohiko; Yamamoto, Katsumi; Sasano, Rin; Kusakabe, Takao; and Moriya, Yasuhiro, 4,356,148, Cl. 422-9.000.
Yamasaki, Toshio: *See*—
Sapkus, Jurgis; Lewis, J. Stephen; and Yamasaki, Toshio, 4,355,482, Cl. 46-106.000.
Yamauchi, Takashi: *See*—
Kobayashi, Yoshiro; Kumadaki, Itsumaro; Takahashi, Masaaki; and Yamauchi, Takashi, 4,356,335, Cl. 570-129.000.
Yamazaki, Etsuo: *See*—
Imazeki, Ryoji; and Yamazaki, Etsuo, 4,356,552, Cl. 364-474.000.
Yamazaki, Hiroaki; and Hasegawa, Takao, to Carl Freudenberg, Firma. Method for the manufacture of a battery separator using tubing. 4,356,046, Cl. 156-86.000.
Yamazaki, Keiji; and Kobori, Toshio, to Minolta Camera Kabushiki Kaisha. Automatic diaphragm control device for cameras. 4,355,875, Cl. 354-38.000.
Yamazaki, Takahumi: *See*—
Shimajiri, Tokiji; Toyoda, Kenichi; and Yamazaki, Takahumi, 4,355,446, Cl. 29-26.00A.
Yanagi, Tetsuo: *See*—
Ishikawa, Toshikatsu; Teranishi, Haruo; Yokoyama, Akira; Yanagi, Tetsuo; and Harada, Hirofumi, 4,356,158, Cl. 423-447.400.
Yanagida, Tuneo, to Olympus Optical Co., Ltd. Magnetic record/reproduction apparatus of a stationary head type. 4,356,520, Cl. 360-63.000.
Yanagita, Haruo: *See*—
United States of America, National Aeronautics and Space Administration; Orloff, Kenneth L.; and Yanagita, Haruo, 4,355,870, Cl. 350-486.000.
Yano, Hiroshi: *See*—
Kogawa, Kouichi; Kawasaki, Teruo; Nomura, Hiroyuki; and Yano, Hiroshi, 4,356,470, Cl. 340-52.00F.
Yano, Kousaku: *See*—
Tanaka, Eiichiro; Yano, Kousaku; Aoki, Yoshitaka; and Fujiwara, Shinji, 4,355,866, Cl. 350-164.000.
Yanobu, Hideo; and Fujiwara, Kazuyuki, to Murata Kikai Kabushiki Kaisha. Pneumatic yarn guiding apparatus for double twisting machine. 4,355,500, Cl. 57-279.000.
Yao, Shi-Kay, to Rockwell International Corporation. Self scanned optical Fourier transform arrangement. 4,355,869, Cl. 350-358.000.
Yarrington, Robert M.: *See*—
Gallagher, James P.; and Yarrington, Robert M., 4,356,081, Cl. 208-139.000.
Yasuhara, Seishi, to Nissan Motor Company, Limited. Injection advance device. 4,355,621, Cl. 123-502.000.
Yates, Samuel L.: *See*—
Wells, Rodney L.; Rowe, Monty L.; Yates, Samuel L.; and Muller, George R., 4,356,280, Cl. 524-148.000.
Yatsuhashi, Kiyomi: *See*—
Ozawa, Akio; Sueyoshi, Susumu; Saito, Keishi; Ishikawa, Kikuo; Yatsuhashi, Kiyomi; Ishii, Satoshi; and Yumino, Masamichi, 4,356,455, Cl. 330-296.000.
Yavordios, Demetre: *See*—
Pacheco, Henri; Descours-Saint-Martino, Marie-Ange; Yavordios, Demetre; and Koeberle, Jean, 4,356,188, Cl. 424-317.000.
Yeh, Nan-Hsiung, to Ampex Corporation. Narrow track magnetoresistive transducer assembly. 4,356,523, Cl. 360-113.000.
Yellow Springs Instrument Company, Inc., The: *See*—
Johnson, Jay M., 4,356,074, Cl. 204-195.00P.
Yokota, Takeshi: *See*—
Eguchi, Yoichi; and Yokota, Takeshi, 4,356,567, Cl. 455-177.000.
Yokoyama, Akira: *See*—
Ishikawa, Toshikatsu; Teranishi, Haruo; Yokoyama, Akira; Yanagi, Tetsuo; and Harada, Hirofumi, 4,356,158, Cl. 423-447.400.
Yoshida, Hiromi: *See*—
Tamura, Sakae; Yoshida, Hiromi; Kotoh, Takehiko; and Kobayashi, Masami, 4,356,049, Cl. 156-220.000.
Yoshida Kogyo K.K.: *See*—
Doori, Hisashi, 4,355,461, Cl. 29-768.000.
Yoshida, Tsunemasa: *See*—
Miura, Shuzi; Yoshida, Tsunemasa; Ono, Shoji; Masuho, Yasuhiko; and Sawada, Shuzo, 4,356,173, Cl. 424-101.000.
Yoshimura, Kunimasa: *See*—
Iwase, Kazuo; Kawai, Hisasi; Yoshimura, Kunimasa; Ito, Toshimitsu; and Ito, Yoshiyasu, 4,356,551, Cl. 364-431.080.
Yoshimura, Noriaki; and Tamura, Masuhiko, to Kuraray Company, Limited. Process for preparing n-octadienol. 4,356,333, Cl. 568-840.000.
Yoshimura, Norihiko; Niiho, Masaaki; Kamasako, Shoji; and Ishiai, Hideyuki, to Asahi Kogaku Kogyo Kabushiki Kaisha. CCD Scanner with improved resolution. 4,356,513, Cl. 358-213.000.
Yoshino Kogyosho Co. Ltd.: *See*—
Yoshino, Yataro; Ota, Akiho; and Sugiura, Hiroaki, 4,355,728, Cl. 215-1.00C.
Yoshino, Yataro; Ota, Akiho; and Sugiura, Hiroaki, to Yoshino Kogyosho Co. Ltd. Synthetic resin thin-walled bottle. 4,355,728, Cl. 215-1.00C.
Youle, Richard J.: *See*—
Neville, David M., Jr.; Youle, Richard J.; and Murray, Gary J., 4,356,117, Cl. 260-112.00R.
Young, Lewis B., to Mobil Oil Corporation. Extending catalyst life by treating with phosphorus and/or steam. 4,356,338, Cl. 585-407.000.
Yue, On-Ching: *See*—
Eng, Kai Y.; and Yue, On-Ching, 4,356,353, Cl. 179-15.55T.

Yumino, Masamichi: *See*—
Ozawa, Akio; Sueyoshi, Susumu; Saito, Keishi; Ishikawa, Kikuo; Yatsuhashi, Kiyomi; Ishii, Satoshi; and Yumino, Masamichi, 4,356,455, Cl. 330-296.000.
Zahnradfabrik Friedrichshafen, AG: *See*—
Liebert, Karl-Heinz; and Tischer, Werner, 4,355,505, Cl. 60-384.000.
Zalisz, Rene; and Salles, Marie-France, to Roussel Uclaf. Novel glycoproteins. 4,356,171, Cl. 424-92.000.
Zans, William A.; and Vander Meulen, Edward F., to Missouri Portland Cement Co. Backless aeration pad for bulk cargo conveying barge or the like. 4,355,928, Cl. 406-90.000.
Zaramella, Bruno: *See*—
Cardone, Michele; Grandini, Angelo; and Zaramella, Bruno, 4,356,467, Cl. 335-295.000.
Zarur, George L.: *See*—
Halpin, Peter T.; and Zarur, George L., 4,356,030, Cl. 75-21.000.
Zaschke, Horst: *See*—
Schubert, Herrmann; Pelzl, Gerhard; Zaschke, Horst; Demus, Dietrich; Nothni, Hans-Ulrich; and Kuschel, Frank, 4,356,103, Cl. 252-299.100.
Zato, Thomas J.: *See*—
Skerlos, Peter C.; Snopko, Paul A.; Templin, Frank C.; and Zato, Thomas J., 4,356,509, Cl. 358-85.000.
Zaveri, Vikram H.: *See*—
Kluting, Bernd A.; and Zaveri, Vikram H., 4,355,846, Cl. 297-366.000.
Zechnall, Martin: *See*—
Will, Gerhard; Stroh, Walter; and Zechnall, Martin, 4,355,550, Cl. 74-872.000.
Zemco, Inc.: *See*—
Blaney, Peter G., 4,355,607, Cl. 123-350.000.
Zengel, Hans-Georg; Bergfeld, Manfred; and Zielke, Rainer, to AKZO N.V. Polymeric N-halogenoamides on the basis of acrylamide and methacrylamide. 4,356,289, Cl. 525-358.000.
Zenith Radio Corporation: *See*—
Skerlos, Peter C.; Snopko, Paul A.; Templin, Frank C.; and Zato, Thomas J., 4,356,509, Cl. 358-85.000.
Zenkoku Nogyo Kyodo Kumiai Rengo Kai: *See*—
Furuya, Hiroshi; Okada, Munehisa; Takemura, Eiichiro; and Sato, Hideyo, 4,355,756, Cl. 229-4.500.
Ziegler, Hermann; and Kolb, Eugen, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Roof for vehicles, especially motor vehicles, for agricultural purposes. 4,355,845, Cl. 296-210.000.
Zielinski, Gloria J. Protective body suit for animals. 4,355,600, Cl. 119-143.000.
Zielke, Rainer: *See*—
Zengel, Hans-Georg; Bergfeld, Manfred; and Zielke, Rainer, 4,356,289, Cl. 525-358.000.
Zimmermann & Jansen GmbH: *See*—
Hannes, Heinz D.; Lothmann, Josef; and Walther, Ludwig, 4,355,787, Cl. 266-92.000.
Zimmermann, Walter: *See*—
Schroder, Joris; Bosshard, Hans; Kiml, Jiri; Kostka, Miroslav; and Zimmermann, Walter, 4,355,705, Cl. 187-29.00R.
Zip Heaters (Aust.) Pty. Limited: *See*—
Massey, Raymond D.; and Di Santo, Vincent, 4,355,452, Cl. 29-437.000.
Zwyro A.G.: *See*—
Tesch, Bernhard, 4,355,501, Cl. 59-82.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 26TH DAY OF OCTOBER, 1982

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Brelsford, John E.: *See*—
Greiner, James G.; Brelsford, John E.; and Thomas, Louis R., Jr., Re. 31,063, Cl. 56-98.000.

Chang, Henry K.; and Hausen, Wolfgang H., to International Business Machines Corporation. Apparatus and method for record reorientation following error detection in a data storage subsystem. Re. 31,069, Cl. 360-53.000.

D'Amico, John J., to Monsanto Company. Substituted benzothiazolines and their use as plant growth regulants. Re. 31,068, Cl. 71-90.000.

Greiner, James G.; Brelsford, John E.; and Thomas, Louis R., Jr., to Sperry Corporation. Adjustable width row crop header. Re. 31,063, Cl. 56-98.000.

Hausen, Wolfgang H.: *See*—
Chang, Henry K.; and Hausen, Wolfgang H., Re. 31,069, Cl. 360-53.000.

International Business Machines Corporation: *See*—
Chang, Henry K.; and Hausen, Wolfgang H., Re. 31,069, Cl. 360-53.000.

Monsanto Company: *See*—
D'Amico, John J., Re. 31,068, Cl. 71-90.000.

Roberts, Maurice P., to TRW Inc. Hydrostatic control unit. Re. 31,067, Cl. 418-61.00B.

Shelor, Clifford D., to Westvaco Corporation. Steam distribution system. Re. 31,065, Cl. 239-120.000.

Shriver, Joe E., to Sperry Corporation. Adjustable width row crop header. Re. 31,064, Cl. 56-98.000.

Sperry Corporation: *See*—
Greiner, James G.; Brelsford, John E.; and Thomas, Louis R., Jr., Re. 31,063, Cl. 56-98.000.
Shriver, Joe E., Re. 31,064, Cl. 56-98.000.

Thomas, Louis R., Jr.: *See*—
Greiner, James G.; Brelsford, John E.; and Thomas, Louis R., Jr., Re. 31,063, Cl. 56-98.000.

TRW Inc.: *See*—
Roberts, Maurice P., Re. 31,067, Cl. 418-61.00B.

Westvaco Corporation: *See*—
Shelor, Clifford D., Re. 31,065, Cl. 239-120.000.

Whittaker, Donald G. M. Steering linkages. Re. 31,066, Cl. 280-103.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Ethyl Products Company: *See*—
McKinney, James C. B1 4,257,561. Cl. 239–58.

Faber, Kurt Heinrich Albert Erich, to Sandvik Aktiebolag. Cutting insert and cutting tool assembly. B1 3,777,341. Cl. 407–114.

Faber, Kurt Heinrich Albert Erich, to Sandvikens Jernverks Aktiebolag. Cutting insert and cutting tool assembly. B1 3,848,303. Cl. 407–77.

McKinney, James C., to Ethyl Products Company. Child-resistant dispensing nozzle assembly. B1 4,257,561. Cl. 239–58.

Sandvikens Jernverks Aktiebolag: *See*—
Faber, Kurt Heinrich Albert Erich. B1 3,848,303. Cl. 407–77.

Sandvik Aktiebolag: *See*—
Faber, Kurt Heinrich Albert Erich. B1 3,777,341. Cl. 407–114.

LIST OF DESIGN PATENTEES

A. Ahlstrom Osakeyhtio: *See*—
Sarpaneva, Timo, 266,650, Cl. D9-354.000.

Airlie, Geoffrey N., to Dobson Park Industries Limited. Toy activity case. 266,682, 10-26-82, Cl. D21-59.000.

Akzona Incorporated: *See*—
Brownell, Kenneth W.; and Hazenfield, Robert C., 266,662, Cl. D13-13.000.

Amerock Corporation: *See*—
Pittenger, Teresa R. B., 266,645, Cl. D8-307.000.

Anja Marketing Inc.: *See*—
Wink, John, 266,633, Cl. D4-18.000.

Arnsteiner, Anton. Ski. 266,688, 10-26-82, Cl. D21-229.000.

Baggio, Alessandro: *See*—
Plewes, William J.; Baggio, Alessandro; and Letzin, Wolfgang, 266,647, Cl. D9-349.000.
Plewes, William J.; Baggio, Alessandro; and Letzin, Wolfgang, 266,648, Cl. D9-353.000.
Plewes, William J.; Baggio, Alessandro; and Letzin, Wolfgang, 266,649, Cl. D9-353.000.

Basey, Otis J.: *See*—
Knoedler, Roy E.; and Basey, Otis J., 266,634, Cl. D6-9.000.

Bee, James W. M., to Northern Telecom Limited. Combined telephone and data set base. 266,667, 10-26-82, Cl. D14-58.000.

Bell, Michial L.: *See*—
Stacy, Jack O., 266,629, Cl. D2-444.000.

Bescherer, Robert E. Bird feeder. 266,705, 10-26-82, Cl. D30-15.000.

Beton, Jean-Claude, to Compagnie Francaise des Produits Orangina. Package of beverage bottles. 266,646, 10-26-82, Cl. D9-337.000.

Black & Decker Inc.: *See*—
Bunyea, Roderick F., 266,707, Cl. D32-33.000.

Boger, David L.; and Collister, Kenneth D., to Miles Laboratories, Inc. Reagent strip. 266,694, 10-26-82, Cl. D24-8.000.

Boldt, Melvin H.; Chuboff, David P.; Trottier, Clement W.; and Slater, Robert E., to Zenith Radio Corporation. Projection television receiver. 266,668, 10-26-82, Cl. D14-79.000.

Bosch-Siemens Hausgerate GmbH: *See*—
Marloth, Herbert, 266,701, Cl. D24-62.000.

Bour, Dixie A. Hat or similar article. 266,628, 10-26-82, Cl. D2-251.000.

Bove, Pierre, to Interdica S.A. Writing instrument. 266,676, 10-26-82, Cl. D19-50.000.

Box, Theodor M., to Cities Service Company. Beverage bottle transport case. 266,709, 10-26-82, Cl. D34-40.000.

Brownell, Kenneth W.; and Hazenfield, Robert C., to Akzona Incorporated. Electrical cable splice enclosure. 266,662, 10-26-82, Cl. D13-13.000.

Brunet, Arthur J. Valve. 266,691, 10-26-82, Cl. D23-19.000.

Bulgari, Marina, to Zoldia Anstalt. Necklet. 266,654, 10-26-82, Cl. D11-5.000.

Bunyea, Roderick F., to Black & Decker Inc. Vacuum cleaner tool. 266,707, 10-26-82, Cl. D32-33.000.

Carbajales Santa Eulalia, Javier B.: *See*—
Carbajales Santa Eulalia, Jesus A.; and Carbajales Santa Eulalia, Javier B., 266,655, Cl. D11-158.000.
Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., 266,656, Cl. D11-158.000.
Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., 266,657, Cl. D11-158.000.
Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., 266,658, Cl. D11-158.000.
Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., 266,660, Cl. D11-162.000.
Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., 266,661, Cl. D11-162.000.

Carbajales Santa Eulalia, Jesus A.; and Carbajales Santa Eulalia, Javier B., to John J. Madison Co., Inc. Figurine of an anteater. 266,655, 10-26-82, Cl. D11-158.000.

Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., to John J. Madison Co., Inc. Figurine of an otter. 266,656, 10-26-82, Cl. D11-158.000.

Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., to John J. Madison Co., Inc. Figurine of a camel. 266,657, 10-26-82, Cl. D11-158.000.

Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., to John J. Madison Company, Inc. Figurine of a fox. 266,658, 10-26-82, Cl. D11-158.000.

Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., to John J. Madison Co., Inc. Figurine of a pelican. 266,660, 10-26-82, Cl. D11-162.000.

Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., to John J. Madison Co. Inc. Figurine of a condor. 266,661, 10-26-82, Cl. D11-162.000.

Chabot, Jean-Marie, to Les Industries Provinciales Ltee. Box cover. 266,651, 10-26-82, Cl. D9-435.000.

Chidester, James R.: *See*—
Trammll, Wallace E.; and Chidester, James R., 266,695, Cl. D24-17.000.

Cho, Yang-Hwi, to Park & Willow Crafts Corp. Extension for cone-shaped traffic marker. 266,653, 10-26-82, Cl. D10-121.000.

Chuboff, David P.: *See*—
Boldt, Melvin H.; Chuboff, David P.; Trottier, Clement W.; and Slater, Robert E., 266,668, Cl. D14-79.000.

Cities Service Company: *See*—
Box, Theodor M., 266,709, Cl. D34-40.000.

Clement, Carl J.: *See*—
Turner, Ian; Tacklind, Thomas A.; Clement, Carl J.; and Stengel, Fred H., 266,671, Cl. D14-111.000.

Clymer, Earl C., Jr.: *See*—
Jean, Donald C., 266,708, Cl. D34-24.000.

Collister, Kenneth D.: *See*—
Boger, David L.; and Collister, Kenneth D., 266,694, Cl. D24-8.000.

Compagnie Francaise des Produits Orangina: *See*—
Beton, Jean-Claude, 266,646, Cl. D9-337.000.

Compton, David E. Dice game board. 266,680, 10-26-82, Cl. D21-41.000.

Cosco, Inc.: *See*—
Knoedler, Roy E.; and Basey, Otis J., 266,634, Cl. D6-9.000.

Crawford, James J.: *See*—
Frezzolini, James; and Crawford, James J., 266,704, Cl. D26-44.000.

Cridland, Michael: *See*—
Pulos, Arthur J.; and Cridland, Michael, 266,665, Cl. D14-6.000.

Crossley, John W. Taxidermal glass eye. 266,696, 10-26-82, Cl. D24-33.000.

Crutchfield, E. Bryant, to Mead Corporation, The. Document file. 266,631, 10-26-82, Cl. D3-30.100.

Dictaphone Corporation: *See*—
Pulos, Arthur J.; and Cridland, Michael, 266,665, Cl. D14-6.000.

Dobson Park Industries Limited: *See*—
Airlie, Geoffrey N., 266,682, Cl. D21-59.000.

Doman, Donald W.; and Elsner, Alfred W., to Kohler Co. Spa table. 266,638, 10-26-82, Cl. D6-177.000.

Dresser Industries, Inc.: *See*—
Monigle, Glenn W.; and Roecker, David W., 266,673, Cl. D15-9.100.

Dretzke, Carl F. Club for a ball and club game. 266,686, 10-26-82, Cl. D21-211.000.

Duskin Franchise Kabushiki Kaisha: *See*—
Nishimura, Haruo; Nakaya, Masaaki; Nakano, Katsuji; Matsuda, Noboru; and Matsumoto, Noriyuki, 266,636, Cl. D6-95.000.

Edwards, Michael J. Combined advertising display stand and brochure holder. 266,637, 10-26-82, Cl. D6-146.000.

Elsner, Alfred W.: *See*—
Doman, Donald W.; and Elsner, Alfred W., 266,638, Cl. D6-177.000.

Entex Industries, Inc.: *See*—
Hanzawa, Tsuneo, 266,679, Cl. D21-13.000.

Evans, Arthur: *See*—
Leavens, Richard; Evans, Arthur; and Fuhrmann, William F., 266,693, Cl. D23-97.000.

Feil, Rolf: *See*—
Harada, Toshio; Feil, Rolf; and Vetter, Roland, 266,642, Cl. D7-128.000.

Finepharm Inc.: *See*—
Lagny, Pierre H., 266,702, Cl. D24-63.000.

Fleischmann, Gary A.; and Peabody, Lawrence C., to Kohler Co. Soap dish. 266,635, 10-26-82, Cl. D6-90.000.

Float to Relax, Inc.: *See*—
Higgins, Gary R., 266,700, Cl. D24-38.000.

Freeborn, Stuart; Lucas, George W., Jr.; and McQuarrie, Ralph, to Lucasfilm, Ltd. Toy figure. 266,685, 10-26-82, Cl. D21-177.000.

Freezinhot Bottle Co., Ltd.: *See*—
Hoi, Cheung T., 266,703, Cl. D26-42.000.

Frezzolini Electronics, Inc.: *See*—
Frezzolini, James; and Crawford, James J., 266,704, Cl. D26-44.000.

Frezzolini, James; and Crawford, James J., to Frezzolini Electronics, Inc. Lamp. 266,704, 10-26-82, Cl. D26-44.000.

Frye, Lonnie E.: *See*—
Polhemus, Marlan H.; and Frye, Lonnie E., 266,675, Cl. D19-22.000.

Fuhrmann, William F.: *See*—
Leavens, Richard; Evans, Arthur; and Fuhrmann, William F., 266,693, Cl. D23-97.000.

General Foods Inc.: *See*—
Plewes, William J.; Baggio, Alessandro; and Letzin, Wolfgang, 266,647, Cl. D9-349.000.
Plewes, William J.; Baggio, Alessandro; and Letzin, Wolfgang, 266,648, Cl. D9-353.000.
Plewes, William J.; Baggio, Alessandro; and Letzin, Wolfgang, 266,649, Cl. D9-353.000.

Gooding, Elwyn R., to University of Michigan, The Regents of the. Police helmet. 266,626, 10-26-82, Cl. D2-231.000.

Gooding, Elwyn R., to University of Michigan, The Regents of the. Protective helmet for athletes. 266,627, 10-26-82, Cl. D2-231.000.

Hanzawa, Tsuneo, to Entex Industries, Inc. Electronic hand-held road race game housing or the like. 266,679, 10-26-82, Cl. D21-13.000.

Harada, Toshio; Feil, Rolf; and Vetter, Roland, to Matsushita Electric Industrial Co., Ltd. Microwave oven. 266,642, 10-26-82, Cl. D7-128.000.

Harada, Toshio: *See*—
Yamamura, Masamichi; Harada, Toshio; and Tanaka, Michio, 266,641, Cl. D7-128.000.

Harrison, Jeffrey, to Kallista Baths, Inc. Bathtub. 266,692, 10-26-82, Cl. D23-55.000.

Hazenfield, Robert C.: *See*—
Brownell, Kenneth W.; and Hazenfield, Robert C., 266,662, Cl. D13-13.000.

Herman, Seymour S., to Stan Herman Studio, Inc. Hospital patient gown. 266,625, 10-26-82, Cl. D2-16.000.

Herrmann, William C. Portable horseshoe pitching target. 266,678, 10-26-82, Cl. D21-4.000.

Higgins, Gary R., to Float to Relax, Inc. Isolation chamber. 266,700, 10-26-82, Cl. D24-38.000.

Hoi, Cheung T., to Freezinhot Bottle Co., Ltd. Torch. 266,703, 10-26-82, Cl. D26-42.000.

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Hughes, Charles E. Toy paddle wheel boat. 266,684, 10-26-82, Cl. D21-130.000.

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Plewes, William J.; Baggio, Alessandro; and Letzin, Wolfgang, to General Foods Inc. Jar. 266,647, 10-26-82, Cl. D9-349.000.
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Plewes, William J.; Baggio, Alessandro; and Letzin, Wolfgang, to General Foods Inc. Combined jar and lid. 266,649, 10-26-82, Cl. D9-353.000.
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Sawada, Masaji; and Yamasaki, Tsutomu, to Sharp Corporation. Combined billing and controller terminal for filling stations. 266,669, 10-26-82, Cl. D14-102.000.
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Topete, Lino Z. Swimming pool and spa combination. 266,698, 10-26-82, Cl. D24-38.000.
Topete, Lino Z. Swimming pool and spa combination. 266,699, 10-26-82, Cl. D24-38.000.
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Bergeson, Paul L. Green ash tree. 4,904, 10-26-82, Cl. 51.000.
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Frecon, Richard S., to Stark Brothers Nurseries & Orchards Company. Spur type winter banana apple tree—Frecon cultivar. 4,901, 10-26-82, Cl. 34.000.
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Kirsch, Ted T., to Sun Valley Bulb Farms, Inc. Lily named Tempo. 4,906, 10-26-82, Cl. 68.000.
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Siri, Angelo J. Miniature carnation. 4,907, 10-26-82, Cl. 70.000.
Stark Brothers Nurseries & Orchards Company: *See*—
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Sun Valley Bulb Farms, Inc.: *See*—
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Weinberger, John H., 4,902, Cl. 38.000.
Weinberger, John H., 4,903, Cl. 43.000.
van der Knaap, Jacques C. M., to Pan-American Plant Company. Chrysanthemum named Cherry Westland. 4,909, 10-26-82, Cl. 79.000.
Warriner, William A., to Jackson & Perkins Co. Rose plant—75-20364. 4,899, 10-26-82, Cl. 14.000.
Weinberger, John H., to Superior Farming Company. Plum tree. 4,902, 10-26-82, Cl. 38.000.
Weinberger, John H., to Superior Farming Company. Peach tree. 4,903, 10-26-82, Cl. 43.000.

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25 R 4,355,633
28 4,355,634
94 4,355,635
204.13 4,355,636
206.19 4,355,637
214 F 4,355,638
214 R 4,355,639
227 4,355,640
460 4,355,641
642 4,355,642
663 4,355,643
689 4,355,644
777 4,355,645
786 4,355,646

CLASS 130

24 4,355,647

CLASS 131

290 4,355,648

CLASS 134

2 4,356,038
8 4,356,039

CLASS 135

1 A 4,355,649
7.1 R 4,355,650

CLASS 136

249 4,356,341

CLASS 137

13 4,355,651
15 4,355,652
102 4,355,653
110 4,355,654
117 4,355,655
318 4,355,656
492 4,355,657
557 4,355,658
625.19 4,355,659
625.63 4,355,660
881 4,355,661

CLASS 138

30 4,355,662
44 4,355,663
110 4,355,664

CLASS 139

13 R 4,355,666
91 4,355,667
96 4,355,665
420 R 4,355,668

CLASS 141

147 4,355,669

CLASS 144

34 R 4,355,670
193 C 4,355,671
208 E 4,355,672
230 4,355,673

CLASS 148

1.5 4,356,040
4,356,041
4,356,042
9 R 4,356,043

CLASS 149

2 4,356,044

CLASS 156

64 4,356,045
86 4,356,046
89 4,356,047
220 4,356,048
4,356,049
273.3 4,356,050
459 4,356,051
498 4,356,052
499 4,356,053
517 4,356,054
626 4,356,055
649 4,356,056

CLASS 157

1.17 4,355,675
1.2 4,355,674

CLASS 160

107 4,355,676
126 4,355,677
332 4,355,678

CLASS 162

3 4,356,057
5 4,356,058
111 4,356,059
181.6 4,356,060

CLASS 164

466 4,355,679
484 4,355,680

CLASS 165

16 4,355,681
48 S 4,355,682
60 4,355,683
154 4,355,684

CLASS 166

240 4,355,685
313 4,355,686

CLASS 171

16 4,355,687

CLASS 172

4 4,355,688
311 4,355,689
4,355,690

CLASS 173

106 4,355,691

CLASS 174

23 C 4,356,342
52 S 4,356,344
74 A 4,356,343
117 F 4,356,345
130 4,356,346

CLASS 177

211 4,355,692

CLASS 178

30 4,356,347

CLASS 179

1 B 4,356,351
1 G 4,356,349
1 GJ 4,356,350
1 MN 4,356,348
7.1 R 4,356,352
15.55 T 4,356,353
16 AA 4,356,354
18 HB 4,356,355
175.1 R 4,356,356

CLASS 180

6.48 4,355,693
14 R 4,355,694
68.5 4,355,695
73 TL 4,355,696
261 4,355,697
273 4,355,698

CLASS 182

12 4,355,699
83 4,355,700
97 4,355,701

CLASS 184

1 D 4,355,702

CLASS 187

9 E 4,355,703
29 R 4,355,704
4,355,705

CLASS 188

24.11 4,355,706
73.32 4,355,707
196 D 4,355,708

CLASS 192

58 B 4,355,709
91 A 4,355,710

CLASS 194

4 C 4,355,711

CLASS 198

460 4,355,712

514 4,355,713
701 4,355,714
781 4,355,715

CLASS 200

5 A 4,356,358
5 R 4,356,357
11 R 4,356,360
11 TC 4,356,359
16 D 4,356,361
47 4,356,362
50 C 4,356,363
61.52 4,356,364
83 J 4,356,365
159 B 4,356,366
298 4,356,367
307 4,356,368
334 4,356,369

CLASS 201

41 4,356,063

CLASS 202

263 4,356,064

CLASS 204

1 T 4,356,065
38 A 4,356,066
43 Z 4,356,067
98 4,356,068
146 4,356,069
158 R 4,356,070
159.21 4,356,071
180 G 4,356,072
192 R 4,356,073
195 P 4,356,074
213 4,356,075
261 4,356,076

CLASS 206

90 4,355,716
140 4,355,717
312 4,355,718
334 4,355,719
460 4,355,720
524.2 4,355,721
575 4,355,722
599 4,355,723

CLASS 208

8 LE 4,356,078
8 R 4,356,077
10 4,356,079
31 4,356,080
139 4,356,081
164 4,356,082

CLASS 209

155 4,356,083
211 4,356,084
273 4,356,085
529 4,355,724

CLASS 219

115 4,356,086
131 4,356,087
198.1 4,356,088
242.4 4,356,089
350 4,356,090
354 4,356,091
611 4,356,092
695 4,356,093
774 4,356,094

CLASS 211

49 R 4,355,725
69.5 4,355,726

CLASS 212

121 4,355,727

CLASS 215

1 C 4,355,728
215 4,355,729
253 4,355,730

CLASS 217

26.5 4,355,731

CLASS 219

10.55 B 4,356,370
10.77 4,356,371
60 R 4,356,372
86.31 4,356,373
121 EH 4,356,377
121 LH 4,356,375
121 LN 4,356,376
121 PE 4,356,374
124.1 4,356,378
209 4,356,379
262 4,356,380
283 4,356,381
297 4,356,382
308 4,356,383
347 4,356,384
441 4,356,385

CLASS 220

1.5 4,355,732

CLASS 221

123 4,355,733

CLASS 222

63 4,355,734
80 4,355,735
4,355,736
81 4,355,737
129 4,355,738
134 4,355,739
180 4,355,740
415 4,355,741
490 4,355,742

CLASS 223

96 4,355,743
114 4,355,744
118 4,355,745

CLASS 224

274 4,355,746

CLASS 226

34 4,355,747
67 4,355,748
171 4,355,749
188 4,355,750

CLASS 227

19 4,355,751

CLASS 229

2.5 R 4,355,755
4.5 4,355,756
5.5 4,355,759
33 4,355,757
39 R 4,355,758

CLASS 235

61 PK 4,356,386
92 PK 4,356,387
96 4,356,388
455 4,356,389
4,356,390
493 4,356,391

CLASS 236

47 4,355,760

CLASS 237

12.3 A 4,355,753
12.3 B 4,355,752

CLASS 238

83 4,355,754

CLASS 239

120 Re.31,065
126 4,355,761
193 4,355,762
302 4,355,763
708 4,355,764
58 B1 4,257,561

CLASS 241

152 A 4,355,765
222 4,355,766
244 4,355,767
261.3 4,355,768
300 4,355,769

CLASS 242

35.5 A 4,355,770
56 R 4,355,771
107.4 A 4,355,772

CLASS 244

102 R 4,355,773
145 4,355,774
158 R 4,355,775

CLASS 246

415 A 4,355,776

CLASS 248

346 4,355,777
429 4,355,778
460 4,355,779
675 4,355,780

CLASS 249

64 4,355,781
93 4,355,782

CLASS 250

201 4,356,392
214 R 4,356,393
222 R 4,356,394
227 4,356,395
4,356,396
231 SE 4,356,397
327.2 4,356,398
461.1 4,356,399

CLASS 251

9 4,355,783
63 4,355,784

CLASS 252

8.5 C 4,356,096
8.55 D 4,356,095
33.4 4,356,097
62.51 4,356,098
90 4,356,099
106 4,356,100
182.1 4,356,101
299.1 4,356,102
4,356,103
299.61 4,356,104
308 4,356,105
313 R 4,356,106
313 S 4,356,107
316 4,356,108
4,356,109
407 4,356,110
429 B 4,356,111
435 4,356,112
455 Z 4,356,113
467 4,356,114
522 A 4,356,115

CLASS 254

362 4,355,785

CLASS 260

112 R 4,356,117
112.5 R 4,356,118
4,356,119
239 A 4,356,120
239.3 R 4,356,121
245.2 R 4,356,122
326 N 4,356,123
326.5 FN 4,356,124
410.9 R 4,356,126
464 4,356,127
465.6 4,356,128
973 4,356,129
989 4,356,130

CLASS 261

77 4,356,131
114 TC 4,356,132

CLASS 264

8 4,356,133
49 4,356,134
61 4,356,135
65 4,356,136
137 4,356,137
164 4,356,138
174 4,356,139
176 R 4,356,140
332 4,356,141
537 4,356,142
557 4,356,143

CLASS 266

62 4,355,786
92 4,355,787
157 4,355,788
207 4,355,789
252 4,355,790

CLASS 267

136 4,355,791
153 4,355,792

CLASS 269

93 4,355,793

CLASS 270

31 4,355,794
58 4,355,795

CLASS 271

20 4,355,796
4,355,797
21 4,355,798
151 4,355,799
229 4,355,800

CLASS 272

119 4,355,801

CLASS 273

11 R 4,355,802
73 J 4,355,803
84 R 4,355,804
85 G 4,355,805
4,355,806
4,355,814
86 R 4,355,807
169 4,355,808
183 D 4,355,809
186 C 4,355,810
201 4,355,811
248 4,355,812
411 4,355,813

CLASS 277

143 4,355,815

CLASS 279

2 R 4,355,816

CLASS 280

103 Re.31,066
605 4,355,817
654 4,355,818
752 4,355,819
779 4,355,820

CLASS 281

33 4,355,821
34 4,355,822

CLASS 282

27.5 4,355,823

CLASS 283

21 4,355,824

CLASS 285

3 4,355,825
45 4,355,826
98 4,355,827
342 4,355,828

CLASS 290

1 R 4,356,401

CLASS 292

68 4,355,829
144 4,355,830

CLASS 294

11 4,355,831
81 R 4,355,832
87 R 4,355,833

CLASS 296

15 4,355,834
36 4,355,835
37.12 4,355,837
37.9 4,355,836
78.1 4,355,838
136 4,355,839
179 4,355,840
185 4,355,841
199 4,355,842
201 4,355,843
205 4,355,844
210 4,355,845

CLASS 297

366 4,355,846

CLASS 300

11 4,355,847

CLASS 301

37 SS 4,355,848

CLASS 303

116 4,355,849

CLASS 307

19 4,356,402
60 4,356,403
115 4,356,404
117 4,356,405
118 4,356,406
221 D 4,356,407
254 4,356,408
264 4,356,409
265 4,356,410
272 A 4,356,411
304 4,356,412
443 4,356,413
455 4,356,414
522 4,356,415
570 4,356,416

CLASS 308

9 4,355,850

CLASS 310

43 4,356,417
184 4,356,418
217 4,356,419
239 4,356,420
320 4,356,421
322 4,356,422
338 4,356,423
357 4,356,424
370 4,356,425

CLASS 312

215 4,355,851

CLASS 313

193 4,356,426
422 4,356,427
485 4,356,428
503 4,356,429

CLASS 315

4 4,356,430
101 4,356,431
287 4,356,432
308 4,356,433
375 4,356,434
4,356,435
386 4,356,436

CLASS 318

254 4,356,437
344 4,356,438
685 4,356,439

CLASS 323

210 4,356,440
4,356,441

CLASS 324

51 4,356,442
4,356,443
54 4,356,444
82 4,356,445
83 R 4,356,446
169 4,356,447
244 4,356,448

CLASS 328

145 4,356,449

CLASS 330

9 4,356,450
107 4,356,451
265 4,356,452
277 4,356,453
294 4,356,454
296 4,356,455

CLASS 331

117 R 4,356,456

CLASS 332

3 4,356,457

CLASS 333

17 M 4,356,458
21 A 4,356,459
28 R 4,356,460
116 4,356,461
128 4,356,462
165 4,356,463
173 4,356,464

CLASS 335

128 4,356,465
203 4,356,466
295 4,356,467

CLASS 336

69 4,356,468

CLASS 337

401 4,356,469

CLASS 339

14 R 4,355,852
17 LM 4,355,853
89 R 4,355,854
94 A 4,355,855
95 R 4,355,856
177 R 4,355,857

CLASS 340

52 F 4,356,470
52 R 4,356,471
146.3 C 4,356,472
146.3 H 4,356,473
509 4,356,474
521 4,356,475
522 4,356,476
572 4,356,477
593 4,356,478
604 4,356,479
620 4,356,480
636 4,356,481
731 4,356,482
805 4,356,483
825.03 4,356,484
825.17 4,356,485
870.38 4,356,486

CLASS 343

5 W 4,356,487
7 PF 4,356,488
7 VM 4,356,489
17.2 R 4,356,490
113 R 4,356,491
700 MS 4,356,492
702 4,356,493
781 CA 4,356,494
786 4,356,495
854 4,356,496
4,356,497
890 4,356,498

CLASS 346

75 4,356,499
4,356,500
155 4,356,501

CLASS 350

3.72 4,355,858
6.1 4,355,859
6.8 4,355,860
61 4,355,861
96.15 4,355,863
96.18 4,355,864
96.2 4,355,862
96.23 4,355,865
164 4,355,866
319 4,355,867
338 4,355,868
358 4,355,869
486 4,355,870

CLASS 351

13 4,355,871

CLASS 354

25 4,355,872
27 4,355,873
31 4,355,874
38 4,355,875
202 4,355,876
217 4,355,877
234 4,355,878
329 4,355,879

CLASS 355

3 BE 4,355,882
3 FU 4,355,881
3 SH 4,355,880
8 4,355,883
14 CH 4,355,884
4,355,885
15 4,355,886
25 4,355,887
32 4,355,888
39 4,355,889
54 4,355,890
57 4,355,891
77 4,355,892

CLASS 356

4 4,355,893
5 4,355,894
141 4,355,895
222 4,355,896
338 4,355,897
346 4,355,898
349 4,355,899
356 4,355,900
373 4,355,901
375 4,355,902
376 4,355,904
382 4,355,903

CLASS 357

13 4,356,502
38 4,356,503
42 4,356,504
72 4,356,505

CLASS 358

13 4,356,507
29 4,356,508
85 4,356,509
143 4,356,510
181 4,356,511
183 4,356,512
213 4,356,513
214 4,356,514
246 4,356,515
288 4,356,516
316 4,356,506

CLASS 360-

13 4,356,517
51 4,356,518
53 Re.31,069
61 4,356,519
63 4,356,520
72.2 4,356,521
77 4,356,522
113 4,356,523
129 4,356,524

CLASS 361

4 4,356,525
59 4,356,526
134 4,356,527
226 4,356,528
304 4,356,529
321 4,356,530
384 4,356,531
393 4,356,532

CLASS 362

17 4,356,533
32 4,356,534
35 4,356,535
72 4,356,536
148 4,356,537
217 4,356,538
273 4,356,539
294 4,356,540

CLASS 363

20 4,356,541
26 4,356,542
56 4,356,543
132 4,356,544

CLASS 364

200	4,356,545
	4,356,546
	4,356,547
	4,356,548
	4,356,549
	4,356,550
431.08	4,356,551
474	4,356,552
483	4,356,553
513	4,356,554
515	4,356,555
560	4,356,556
562	4,356,557
724	4,356,558
	4,356,559

CLASS 366

79	4,355,905
274	4,355,906

CLASS 369

221	4,356,560
225	4,356,561

CLASS 370

20	4,356,562
58	4,356,563

CLASS 371

40	4,356,564

CLASS 372

61	4,356,565

CLASS 373

107	4,356,340

CLASS 374

26	4,355,907
39	4,355,908
135	4,355,909
162	4,355,910
165	4,355,911
208	4,355,912

CLASS 375

116	4,356,566

CLASS 376

203	4,356,144
254	4,356,061
265	4,356,145
272	4,356,062
	4,356,146
291	4,356,147

CLASS 378

138	4,356,400

CLASS 400

63	4,355,913
690.1	4,355,914

CLASS 401

216	4,355,915

CLASS 402

41	4,355,916

CLASS 403

24	4,355,917
170	4,355,918
191	4,355,919
195	4,355,920
316	4,355,921
385	4,355,922

CLASS 405

59	4,355,923
145	4,355,924
172	4,355,925
	4,355,926
233	4,355,927

CLASS 406

90	4,355,928
125	4,355,929
182	4,355,930

CLASS 407

77	B1 3,848,303
114	B1 3,777,341

CLASS 408

123	4,355,931
188	4,355,932

CLASS 411

19	4,355,933
38	4,355,934

CLASS 413

17	4,355,935

CLASS 414

118	4,355,936
217	4,355,937
222	4,355,938
413	4,355,939
439	4,355,940
490	4,355,941
555	4,355,942
557	4,355,943
685	4,355,944
686	4,355,945
707	4,355,946
785	4,355,947

CLASS 415

1	4,355,948
35	4,355,949
53 R	4,355,950
89	4,355,951
115	4,355,952
164	4,355,953
213 B	4,355,954

CLASS 416

23	4,355,955
132 B	4,355,956
145	4,355,957
197 A	4,355,958

CLASS 417

223	4,355,959
419	4,355,960
494	4,355,961
552	4,355,962

CLASS 418

61 B	Re.31,067
63	4,355,963
76	4,355,964
111	4,355,965

CLASS 422

9	4,356,148
56	4,356,149
98	4,356,150
145	4,356,151
248	4,356,152

CLASS 423

10	4,356,153
	4,356,154
226	4,356,155
328	4,356,156
419 P	4,356,157
447.4	4,356,158
481	4,356,159
492	4,356,160
573 R	4,356,161
600	4,356,162
657	4,356,163

CLASS 424

1	4,356,164
	4,356,165
19	4,356,166
38	4,356,167
52	4,356,168
89	4,356,169
92	4,356,170
	4,356,171
101	4,356,172
	4,356,173
114	4,356,174
241	4,356,175
244	4,356,176
248.54	4,356,177
	4,356,178
249	4,356,179
250	4,356,180
258	4,356,181
263	4,356,182
	4,356,183
267	4,356,184
270	4,356,185
275	4,356,186
304	4,356,187
317	4,356,188
	4,356,189
319	4,356,190
321	4,356,191
326	4,356,192
	4,356,193
	4,356,194

CLASS 425

140	4,355,966
503	4,355,967
526	4,355,968

CLASS 426

51	4,356,195
69	4,356,196
89	4,356,197
96	4,356,198
105	4,356,199
	4,356,200
138	4,356,201
	4,356,202
266	4,356,203
321	4,356,204
518	4,356,205
519	4,356,206
548	4,356,207
592	4,356,208
627	4,356,209

CLASS 427

38	4,356,210
85	4,356,211
175	4,356,212
212	4,356,213
233	4,356,214
244	4,356,215
286	4,356,216
	4,356,217
355	4,356,218
386	4,356,219

CLASS 428

17	4,356,220
35	4,356,221
78	4,356,222
156	4,356,223
220	4,356,224
234	4,356,225
246	4,356,226
265	4,356,227
283	4,356,228
288	4,356,229
290	4,356,230
304.4	4,356,231
325	4,356,232
336	4,356,233
372	4,356,234
379	4,356,235
403	4,356,236
404	4,356,237
461	4,356,238

CLASS 429

7	4,356,239
101	4,356,240
104	4,356,241
234	4,356,242

CLASS 430

58	4,356,243
82	4,356,244
122	4,356,245
136	4,356,246
195	4,356,247
209	4,356,248
215	4,356,249
216	4,356,250
253	4,356,251
270	4,356,252
291	4,356,253
296	4,356,254
325	4,356,255
332	4,356,256
496	4,356,257
557	4,356,258

CLASS 431

4	4,355,969
77	4,355,970
359	4,355,971

CLASS 432

148	4,355,972
209	4,355,973
253	4,355,974

CLASS 433

11	4,355,975
83	4,355,976
131	4,355,977
220	4,355,978
225	4,355,979
226	4,355,980

CLASS 434

14	4,355,981
30	4,355,982
219	4,355,983
335	4,355,984

CLASS 435

2	4,356,259
29	4,356,260
68	4,356,261
97	4,356,262
101	4,356,263
119	4,356,264
	4,356,265
162	4,356,266
179	4,356,267
253	4,356,268
316	4,356,269
317	4,356,270

CLASS 440

51	4,355,985
53	4,355,986

CLASS 441

41	4,355,987

CLASS 455

177	4,356,567
212	4,356,568

CLASS 474

91	4,355,988
94	4,355,989
	4,355,990
110	4,355,991
152	4,355,992
231	4,355,993
270	4,355,994

CLASS 493

43	4,355,995

CLASS 501

84	4,356,271
87	4,356,272

CLASS 521

114	4,356,273
120	4,356,274
136	4,356,275

CLASS 523

404	4,356,276
406	4,356,277
414	4,356,278

CLASS 524

102	4,356,279
148	4,356,280
397	4,356,281
398	4,356,282
504	4,356,283
520	4,356,284
837	4,356,116

CLASS 525

111	4,356,285
183	4,356,286
204	4,356,287
308	4,356,288
358	4,356,289
397	4,356,290
403	4,356,291
419	4,356,292
477	4,356,293

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	231	266,626
		266,627
	251	266,628
	444	266,629
D3—	26	266,630
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D6—	9	266,634
	90	266,635
	95	266,636
	146	266,637
	177	266,638
	191	266,639
D7—	105	266,640
	128	266,641
		266,642
	208	266,643
D8—	95	266,644
	307	266,645
D9—	337	266,646
	349	266,647
	353	266,648
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	354	266,650
	435	266,651
D10—	119	266,652
	121	266,653
D11—	5	266,654
	158	266,655
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	160	266,659
	162	266,660
		266,661
D13—	13	266,662
D14—	2	266,663
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	6	266,665
	53	266,666
	58	266,667
	79	266,668
	102	266,669
	109	266,670
	111	266,671
	114	266,672
D15—	9.1	266,673
D18—	1	266,674
D19—	22	266,675
	50	266,676
	97	266,677
D21—	4	266,678
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	59	266,681
		266,682
	82	266,683
	130	266,684
	177	266,685
	211	266,686
	220	266,687
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D23—	11	266,690
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